APPLICABLE LAWS AND REGULATIONS

FEDERAL STATUTES

Migratory Bird Treaty of 1918	16 U.S. Code 703
Coastal Zone Management Act	16 U.S. Code 1451
Endangered Species Act	16 U.S. Code 1531
Coastal Barrier Resources Act	16 U.S. Code 3502
Rivers and Harbors Act of 1899	33 U.S. Code 401
Water Pollution Control Act (Clean Water Act)	33 U.S. Code 1251
Marie Protection, Research, and Sanctuaries Act	33 U.S. Code 1401
Marine Plastic Pollution Research and Control Act of 1987	33 U.S. Code 1901
National Flood Insurance Act	42 U.S. Code 4001
National Environmental Policy Act	42 U.S. Code 4321
Americans With Disabilities Act	42 U.S. Code 12101

STATE STATUTES, REGULATIONS AND EXECUTIVE ORDERS

Landowner Liability Limitations	Mass. General Laws (M.G.L.) Chapter 21, §17c
Coastal Zone Management Act and Regulations	M.G.L. Chapter 21A, §4A 301 Code of Mass Regulations (CMR) 20.00
CZM Federal Consistency Regulations	301 CMR 21.00
Clean Water Act and Regulations	M.G.L. Chapter 21A, §42 314 CMR 1-15.00
Sanitary Code/Title V Regulations	310 CMR 15.00

Handicap Access Act and Regulations	M.G.L. Chapter 22, §13A 521 CMR 2-3.00
MA Environmental Policy Act and Regulations	M.G.L. Chapter 30, §§61-62H 301 CMR 11.00
Areas of Critical Environmental Concern Regulations	301 CMR 12.00
Motor Vehicles Act and Regulations	M.G.L. Chapter 90 540 CMR1-19.00
Motorboats and Other Vessels Act and Regulations	M.G.L. Chapter 90B 323 CMR 1-5.00
Public Waterfront Act and Regulations	M.G.L. Chapter 91 310 CMR 9.00
Marine Fish and Fisheries Act and Regulations	M.G.L. Chapter 130 322 CMR 1-12.00
Coastal Wetlands Restriction Act and Regulations	M.G.L. Chapter 130, §105 302 CMR 4.00
Inland Fisheries, Game and Other Natural Resources Act and Regulations	M.G.L. Chapter 131 321 CMR 1-9.00
Wetlands Protection Act and Regulations	M.G.L. Chapter 131, §40 310 CMR 10.00
Endangered Species Act and Regulations	M.G.L. Chapter 131A 321 CMR 10.00
Ocean Sanctuary Act and Regulations	M.G.L. Chapter 132A 302 CMR 5.00
Pesticide Control Act and Regulations	M.G.L. Chapter 132B 333 CMR 1-11.00
Building Standards and Regulations	M.G.L. Chapter 143 248 CMR (Plumbing) 521 CMR 2-3.00 (Architectural Access Board) 780 CMR 1-34.00 (Building Code, inc. floodplain)

MA Historic Commission Regulations	950 CMR 70-71.00
Crimes Against the Person	M.G.L. Chapter 265
Crimes Against Property	M.G.L. Chapter 266
Crimes Against Public Health	M.G.L. Chapter 270

Executive Order No.149: Flood Insurance Coordination (1978)

Executive Order No. 181: Barrier Beaches (1980)

Executive Order No. 190: Regulations of Off-Road Vehicle Use on Public Lands Containing Coastal Wetlands Resources (1980)

LOCAL

Town of Salisbury ordinances, by-laws, regulations, rules, policies and guidelines covering the following:

Zoning
Wetlands
Waterways
Animal Control
Loitering
Health

COMMONWEALTH OF MASSACHUSETTS

BY His Excellency

EDWARD J. King
Governor

EXECUTIVE ORDER NO. 181

BARRIER BEACHES

Preamble

A barrier beach is a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh brackish or saline water or marsh system. It is a fragile buffer that protects landward areas from coastal storm damage and flooding.

The strength of the barrier beach system lies in its dynamic character; its ability to respond to storms by changing to a more stable form. Frequently man induced changes to barrier beaches have decreased the ability of landform to provide storm damage prevention and flood control. Inappropriate development on barrier beaches has resulted in the loss of lives and great economic losses to residents and to local, state and federal governments. The taxpayer, who often cannot gain access to barrier beach areas, must subsidize disaster relief and flood insurance for these high hazard areas.

Since barrier beaches are presently migrating landward in response to rising sea level, future storm damage to development located on the barriers is inevitable.

WHEREAS, the Commonwealth seeks to mitigate future storm damage to its barrier beach areas;

NOW, THEREFORE, I, Edward J. King, Governor of the Commonwealth of Massachusetts, by virtue of the authority vested in me by the Constitution and laws of the Commonwealth, do hereby order and direct all relevant state agencies to adopt the following policies:

1. *Barrier beaches shall be given priority status for self-help and other state and federal acquisition programs and this priority status shall be incorporated into the Statewide Outdoor Comprehensive Recreation Plan. The highest priority for disaster assistance funds shall go towards relocating willing sellers from storm damaged barrier beach areas.*

2. *State funds and federal grants for construction projects shall not be used to encourage growth and development in hazard prone barrier beach areas.*

3. *For state-owned barrier beach property, management plans shall be prepared which are consistent with state wetland policy and shall be submitted to the Secretary of Environmental Affairs for public review under the provisions of the Massachusetts Environmental Policy Act.*

4. *At a minimum, no development shall be permitted in the velocity zones or primary dune areas of barrier beaches identified by the Department of Environmental Quality Engineering.*

5. *Coastal engineering structures shall only be used on barrier beaches to maintain navigation channels at inlets and then only if mechanisms are employed to ensure that downdraft beaches are adequately supplied with sediment.*

6. *Dredge material of a compatible grain size shall be used for barrier beach nourishment, if economically feasible.*

7. *The Coastal Zone Management Office shall coordinate state agency management policy for barrier beach areas.*

Given at the Executive Chamber in Boston
this 8th day of August, in the
year of Our Lord one thousand nine hundred
and eighty and of the independence of
America, two-hundred and five.

EDWARD J. KING
GOVERNOR
Commonwealth of Massachusetts

MICHAEL JOSEPH CONNOLLY
Secretary of the Commonwealth

GOD SAVE THE COMMONWEALTH OF MASSACHUSETTS

By His Excellency
MICHAEL S. DUKAKIS
Governor

Executive Order No. 149
PROVISIONS FOR STATE COORDINATION AND PARTICIPATION WITH THE FEDERAL ADMINISTRATION UNDER THE NATIONAL FLOOD INSURANCE ACT OF 1968, AS AMENDED, AND RULES AND REGULATIONS PROMULGATED THEREUNDER.

WHEREAS, uneconomic uses of the Commonwealth's floodplains are occurring and the potential for flood losses continues to increase despite substantial efforts to control floods; and

WHEREAS, national, state and local studies of areas and property subject to flooding indicate a further increase in flood damage potential and flood losses, even with continuing investment in flood protection structures; and

WHEREAS, the Commonwealth of Massachusetts has extensive and continuing programs of the construction of buildings, roads, and other facilities and annually acquires and disposes of lands in flood hazard areas, all of which activities significantly influence patterns of commercial, residential, and industrial development; and

WHEREAS, the availability of programs for federal loans and mortgage insurance, state financial assistance, and land use planning are determining factors in the utilization of lands; and

WHEREAS, the availability of flood insurance under the National Flood Insurance Program, as provided by the National Flood Insurance Act of 1968, as amended, requires that a state agency be assigned to the coordination of federal, state and local aspects of floodplain, mudslide and flood-related erosion area management activities in the state; and

WHEREAS, the Massachusetts Water Resources Commission is the state agency responsible for state level programs for flood prevention, flood control, and flood protection, as provided by M.G.L. c.21, §9;

NOW, THEREFORE, I, MICHAEL S. DUKAKIS, by virtue of the authority vested in me as Governor of the Commonwealth of Massachusetts, do order and direct:

1. The Water Resources Commission is hereby designated as the state coordinating agency to assist in the implementation of the National Flood Insurance Program, 24 CFR §1909 et al. (1977) The Water Resources Commission is further designated as the state agency to implement the floodplain management criteria for state-owned properties in special hazard areas, as set forth in 24 CFR §19l0.12 (1977). Pursuant to this designation, the Commission shall encourage a broad and unified effort to prevent uneconomic uses and development of the state's floodplains, and in particular, to alleviate the risk of flood losses to state lands and installations and state-financed or supported improvements. Specifically:

(i.) Under the leadership and direction of the Water Resources Commission, all state agencies directly responsible for the construction of all structures, roads or other facilities shall, to the extent possible, avoid the use of floodplains in connection with such facilities.

In the event that construction of such facilities in a floodplain cannot be avoided, the floodplain management criteria set forth in 24 CFR §§1910.3, 1910.4, and 19l0.5 shall be observed when applicable. Flood-proofing measures shall be applied to existing state facilities where possible in order to reduce the potential for future flood damage.

(ii.) All state agencies responsible for the administration of grant or loan programs, involving the construction of structures, roads, or other facilities shall evaluate potential flood hazards to such facilities and, in order to minimize both the exposure of such facilities to flood damage and the need for future state expenditures for flood protection and disaster relief, shall to the extent possible avoid the use of floodplains for such construction.

(iii.) All state agencies responsible for the disposal of lands or properties shall, prior to disposal, a) evaluate flood hazards in connection with such lands or properties and b) attach such restrictions with respect to their use as are necessary to minimize future state expenditures for flood protection and disaster relief. In carrying out the purposes of this paragraph, each state agency may make allowance for any estimated reduction in fair market value resulting from the incorporation of use restrictions in the disposal documents.

(iv.) All state agencies responsible for programs which affect land use planning, including state permit programs, shall take flood hazards into account when evaluating plans, and encourage land use appropriate to the degree of hazard involved.

2. The Water Resources Commission is hereby designated as the agency responsible for making recommendations as to areas in the state eligible for hydrological ratemaking studies as required by the rules and regulations of the Federal Insurance Administration.

Given at the Executive Chamber in Boston this 29th day of November in the year of our Lord one thousand nine hundred and seventy-eight and of the Independence of the United States of America the two hundred and second.

MICHAEL S. DUKAKIS
Governor
COMMONWEALTH OF MASSACHUSETTS

PAUL GUZZI
Secretary of the Commonwealth

dcr
Massachusetts

S A L I S B U R Y B E A C H S T A T E R E S E R V A T I O N
BEACH ACCESS AUTHORIZATION

DATE: _____

APPLICANT'S NAME AND ADDRESS

NAME:
STREET:
TOWN:
SIGNATURE:

Request

Please include suggested dates, times, a short description of work, type of equipment used on beach for access and for project. Applicant **must** attach copy of permit for work issued by the Salisbury Conservation Commission

Conditions on Approval

Conditions as set by the DCR in consultation with the Salisbury Conservation Commission

Approval

	DATE	CHECK ONE APPROVED	DISAPPROVED
SALISBURY CONSERVATION COMMISSION PRINT NAME SIGNATURE		☐	☐
SALISBURY BEACH STATE PARK SUPERVISOR PRINT NAME SIGNATURE		☐	☐

RESOURCE PROTECTION PARTNERS

DCR's efforts to manage the natural resources at Salisbury Beach would not be successful without the help of the following resource protection organizations:

The Town of Salisbury

The Reservation staff work closely with the town of Salisbury's municipal departments, such as the DPW, working together after large coastal storms, with cleanup and recovery efforts. The Harbor Masters help the lifeguards with rescues and watercraft problems. The Police and Fire quickly respond to all medical emergencies and assist with law enforcement problems.

Salisbury Beach Betterment Association

SBBA is not an official advisory group, but more like a type of "friends group". One of the groups mission is to assist DCR through periodic meetings to review existing management and future improvements to the property. The group consists primarily of local residents and abutters to the property. They help organize volunteers to help with beach clean-ups, dune fence installation, dune grass plantings, and make management recommendations, etc. The group also provides the Department with the local and regional perspective on issues related to DCR and the reservation.

Coastal Zone Management

The Massachusetts Office of Coastal Zone Management (CZM) is a part of the Executive Office of Energy and Environmental Affairs (EOEEA). CZM's mission is to balance the impacts of human activity with the protection of coastal and marine resources. As a networked program, CZM was specifically established to work with other state agencies, federal agencies, local governments, academic institutions, nonprofit groups, and the general public to promote sound management of the Massachusetts coast.

Massachusetts Department of Environmental Protection

The Department of Environmental Protection (MassDEP) is the state agency responsible for ensuring clean air and water, the safe management of toxics and hazards, the recycling of solid and hazardous wastes, the timely cleanup of hazardous waste sites and spills, and the preservation of wetlands and coastal resources. MassDEP is a regulatory agency that is also available to provide technical assistance on environmental matters within its jurisdiction.

Massachusetts Audubon Society: Joppa Flats

Recently the Massachusetts Audubon society opened the doors to their new headquarters located across the Merrimack River in Newburyport. They are willing to assist with the

protection and management of rare shorebirds and offers a variety of informational educational sessions.

Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement

The *Natural Heritage & Endangered Species Program* provides training, information and management recommendations relative to the Department's rare species protection measures. The *Environmental Police-Law Enforcement* provides much needed enforcement services for DCR staff. Officers assist with traffic control, enforcing rules and regulations, monitoring sportsmen licenses and responding to emergencies.

Massachusetts Emergency Management Agency

The Massachusetts Emergency Management Agency assists DCR before, during and after major storm events, In particular MEMA act's as DCR's liaison to obtain FEMA money.

The United States Coast Guard

The Coast Guard maintains air patrols over the Massachusetts coastline, including Salisbury beach using helicopters. The U.S. Coast Guard Newburyport Station is located on the Merrimack River, just minutes away. They have daily boat patrols during the summer season and they assists with emergency rescues, either off shore or on the jetties.

The Massachusetts State Police Mounted Unit

Every year from Memorial Day weekend thru Labor Day weekend, 3-4 MSPMU are assigned to Salisbury Reservation to patrol the beach and reservation. They assist the staff with all sorts of violations, medical emergencies and enforcement of the rules and regulations. Their shifts constitute horseback and cruiser patrols (8am-4pm and 6pm-2am).

A GUIDE TO DUNE STABILIZATION

P.O. Box 5303
Salisbury, MA 01952
(508) 462-4481

MIKE MAGNIFICO
DEPARTMENT OF ENVIROMENTAL MANAGEMENT
SALISBURY BEACH STATE RESREVATION

A) IMPORTANCE OF DUNES

- The primary dune is the first line of defense against storms; it absorbs and mitigates the force of onshore storm wave action, protecting your house and the mainland behind the dunes. Because dunes are at a higher elevation than the beach, they protect inland areas from storm damage and flooding by storm waves. Vegetation cover, such as dune grass, contributes to the growth and stability of coastal dunes, minimizing wind erosion and trapping wind blown sand. We must maintain this dune system in order to retain its protective qualities.

B) DUNE GRASS PROTECTION PROGRAM

- Dune vegetation is very intolerant of both pedestrian and vehicular traffic. Even the pressure of foot traffic will cause severe root dieback, resulting in substantial reduction of vegetative cover, which in turn can lead to rapid deterioration of the entire dune system. That is why it is so important to keep people off the dunes, especially in the summer when most vegetative destruction occurs due to increased foot traffic.

C) SNOW FENCING

- Snow fence shall be installed around the perimeter or in front of the dune to direct pedestrian movement away from the fragile dune area. The best current available barrier material is wood picket snow fencing with a 50% porosity and posts placed no more that 12 feet apart. You will be supplied with one roll of snow fence, one bundle of 5 posts and 15 aluminum fence fasteners. Additional snow fence and stakes ban be purchased at your local hardware store. If you do not have an existing dune in front of your house, install the fence approximately 50-100 feet from your house, parallel to the ocean on perpendicular to the prevailing winds.(NE).

SNOW FENCE INSTALLATION

1) Space the stakes approx 12 feet apart and drive them at least two feet into the ground.

2) Attach fencing to stakes at the top, middle and bottom with aluminum fence fasteners.

3) Bottom of wooden fence shall contact the ground surface along its entire length, tapping the top of the wooden slats may be necessary to ensure that the fence touches the ground.

4) At the ends of each fence, wrap post with at least one or two wooden slats and twist wires around post to attach the wire ends to the fence. Make sure that no wire ends are exposed to the public.

DUNE GRASS PLANTING

American Beach Grass will be available for planting this spring. It can also be purchased from commercial growers or collected by thinning native strands. Thinning native strands must be done with extreme care in order to avoid creation of new areas of erosion. Plants should be taken only from back dune areas or protected areas that have dense stands of beach grass. When in doubt, call us and we will analyze the area and give you our recommendation.

A) THINNING NATIVE AMERICAN STRANDS OF BEACH GRASS

-dig clumps of beach grass with a shovel.
-shake to release the sand, separate into groups of three live culms (stems) each, and remove dead culms, blades and any underground stems. Culms should be planted as soon as possible and watered.

B) PLANTING PROCEDURE

Beach grass can be planted successfully from mid October to mid April (the best time to plant is between March and April when the ground is not frozen) Survival rates ar much lower in the summer months and not recommended. Open a hole 12-14 inches deep with a narrow bladed spade. Space holes 18-20 inches apart, and stagger rows for maximum sand entrapment. Place three culms in hole with main root seven to nine inches below surface of the sand. Pack the sand around the plants by stomping on the ground next to the plants with your feet to eliminate air from the root zone. Fertilize in spring only. Use inorganic, time released granular fertilizer such as 10-10-10 or 15-10-10 at a rate of 2 ponds per 1,0000 square feet.

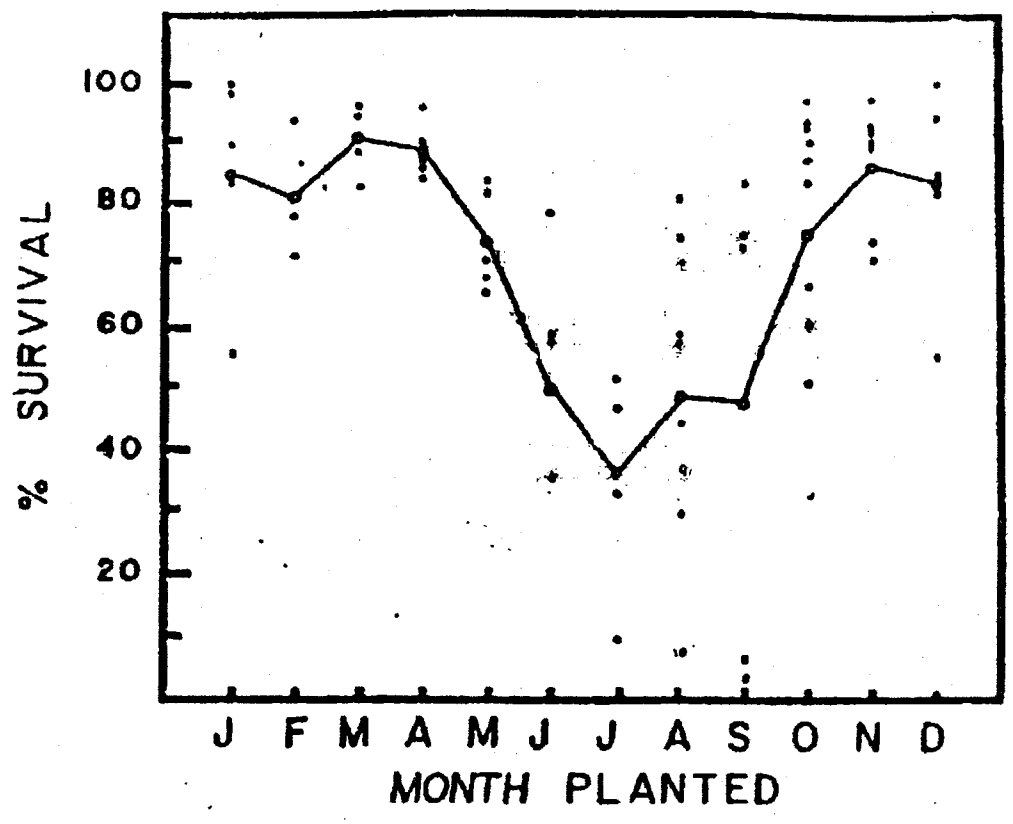
C) COVERAGE

Roughly 3,000 culms, at three culms per hole, and enough to cover area about 2,00 square feet (40 feet by 50 feet). Studies have shown that a 90 foot wide strip of vigorously growing beach grass, planted perpendicular to the prevailing wind direction, will trap and retain all of the sand being blown by the wind. Therefore, of possible, in order to get the maximum dune stabilization, the planted areas should be at least 90 feet wide.

D) OTHER DUNE PLANTS

Other native plants that will grow on dunes include seaside goldenrod, beach pea, bayberry, dusty miller, weeping lowe grass and beach plum. Non-native plants that do well at coastal locations include Japanese black pine, rugosa rose, bristly locust, and autumn olive.

In conclusion, we must take protective measures to ensure that our dunes will last and protect the land and property behind them. We have experienced several damaging storms in recent years and realize how important it is to have a well established dune system. One of the most important mechanisms in protecting the dunes is through public education and individual conservation. Sand, vegetation and fencing are three major components required to maintain a healthy dune system, especially where recreational use is extremely high. So, planting, protecting and preserving the dune system is critical in order to maintain Salisbury Beach, the environment, your property and our way of life. If you have any questions or would like more information, please, call our office at 462-4481.



The best time to plant beachgrass is from October through April. Note the poor survival when planted from June through September.

Commercial Sources of Beach Grass
Beachgrass is usually sold in bundles of 300 culms per bundle. The price in this area ranges from $20.00 per bundle for 1-5 bundles to $15.00 per bundle for 500 or more bundles.

Soil Conservation Service
Bristol County Conservation District
21 Spring Street
Taunton, MA 02780
508-824-6668

Harold Fine
24 Smith Street
Rehoboth, MA 02769
508-222-3477

Springer Environmental Services
245 Keene Road
Acushnet, MA 02743

Agricultural Stabilization Nursery
P.O. Drawer 987
New Bern, NC 28560
919-637-3567

Church's Nursery
Old Shore Road(Erma Road) SEASHORE
RFD #1 609 884 3927
Cape May, NJ 08204

Moore's Sod Farm
P.O. Box 281
Berlin, MD 21811

Peat and Son
Kilby Ln.
Jericho, NY
(516) 288-3458

SALISBURY BEACH DUNE WALKOVER ACCESS DESIGN STANDARDS

(Modified) May 2, 2007

The intent of these standards is to provide a means of balancing the need for beach access with protecting the Coastal Dunes, which in turn will help to maintain the dune's function of storm damage protection and flood control. These design standards will be used as part of the Wetlands Protection Act permitting process and wetland enforcement cases by the Massachusetts Department of Environmental Protection (MassDEP) and as part of a permit approval process by the Massachusetts Department of Conservation and Recreation (DCR) for granting access to the State Beach. In addition, the Salisbury Conservation Commission will be informed of these standards and will be encouraged to follow them for wetland permitting and enforcement projects. These design standards are to be used for new access, as well as substantially reconstructed/substantially damaged walkways or where it has been determined that access has been placed or constructed in violation of the Wetlands Protection Act. MassDEP and DCR agree to work cooperatively in following these design standards.

General Design Standards

1. Wherever possible, existing public access maintained by the State or the Town of Salisbury shall be preferred over private access. Therefore, the preferred access to the beach will be via the public access for properties that directly abut or are adjacent to these access ways.
2. Wherever possible, common or shared access servicing multiple properties will be encouraged.
3. Site conditions will help identify if an elevated boardwalk is preferred over an at-grade access. This will be determined upon the size of the dune and the slope of the seaward dune face. Dunes that are relatively small in height and that have a gradual seaward dune face may be suitable for an at- grade access. If the site is suitable for an at-grade access it shall be no wider than 36 inches and the alignment shall be well marked. The direction or approach of the at-grade access will be determined based upon site conditions. Generally the approach should be to the southeast at a 45-degree angle to the shore.
4. Where site conditions require an elevated boardwalk the following standards shall be employed:
    a. The height from the dune surface (sand) to the lowest horizontal part of the boardwalk (excluding piles or other vertical supports) shall be a minimum of 18 inches for retrofitted boardwalks and a minimum of 24 inches for new boardwalks or as high as it is wide, whichever is appropriate. No skirts, lattice or similar trim components will be allowed. The design height above the dune shall also consider the height of the surrounding dune.
    b. The maximum width of the boardwalk shall be 36 inches.
    c. All boardwalk decking shall have a minimum of one inch spacing.

d. The boardwalk shall be designed to allow modifications as the dune grows in height and width.
e. The boardwalk shall be designed with removable or breakaway sections, especially for those areas where the boardwalk or stairs from the boardwalk are located on the most seaward face of the dune or on the beach.
f. The approach or direction of the boardwalk from the private property to the beach will be determined based upon site conditions.
g. No risers will be allowed on stairs.
h. Vertical supports shall be pilings or posts that are driven and are not to be encased in concrete or other footings. No heavy equipment or machinery shall be used to install the vertical supports.
i. Vertical supports are not to be installed in dune slopes that are steeper than 30 degrees.
j. Any portion of the boardwalk or stairs that are removed on a seasonal basis shall not be stored on DCR property or on any portion of a vegetated dune. Storage is recommended to be on portions of the boardwalk that are not removed.

Review Process

Requests for access to the beach from private property may occur as a result of a permitting action or enforcement action. It is recommended that DCR should be involved in the review of the access as soon as possible. DCR will provide assistance regarding the type of access (at-grade or elevated) and the direction of the approach to the beach.

Before an Order of Conditions has been issued or an enforcement document has been finalized DCR should be notified. When a Notice of Intent is filed with the Conservation Commission and MassDEP, proof must be provided that requests for review will be made to the DCR Salisbury Beach Reservation. For enforcement actions MassDEP will provide a written explanation of the proposed access and how the access helps to protect the coastal resources and whether the access will interfere with public access to or on the beach. DCR has offered that they will develop a checklist to track the approval process within their agency.

Besides these general design standards there is a need to include requirements for proper maintenance to make sure the structure does not become a nuisance or obstruction on the beach, review requirements for substantial improvements or modifications (but no review for routine maintenance of the approved existing boardwalk). This can be included as part of the DCR review and approval process.

dcr
Massachusetts

S A L I S B U R Y B E A C H S T A T E R E S E R V A T I O N
DUNE CROSSING AUTHORIZATION

TRACKING SHEET

DATE: _____ TRACKING NUMBER: _____

APPLICANT'S NAME AND ADDRESS

NAME:
STREET:
TOWN:
SIGNATURE:

Pre-approval

	DATE	CHECK ONE APPROVED	DISAPPROVED
SALISBURY CONSERVATION COMMISSION PRINT NAME SIGNATURE		☐	☐
DEPARTMENT OF ENVIRONMENTAL PROTECTION PRINT NAME SIGNATURE		☐	☐
SALISBURY BEACH STATE PARK SUPERVISOR PRINT NAME SIGNATURE		☐	☐
NORTHEAST REGIONAL DIRECTOR PRINT NAME SIGNATURE		☐	☐

Project completion final sign-off

		Approved	Disapproved
SALISBURY CONSERVATION COMMISSION	SIGNATURE	☐	☐
SALISBURY BEACH STATE PARK SUPERVISOR	SIGNATURE	☐	☐

Procedures for submitting a request:

1. Applicant's can obtain an Authorization Tracking sheet, tracking number and instructions on design and construction of the boardwalk/walkover at the Salisbury Beach State Reservation. Reservation staff will review and discuss design ideas and do a site visit if necessary.

2. Applicants must then go through the Salisbury Conservation Commission to obtain a NOI or a RDA if special conditions and circumstances exist. Applicants will need to present their designs and sketches at the Conservation Commission public meeting and get the proper permission to proceed.

3. For requests is subject to an enforcement action from the Salisbury Conservation Commission the applicant must submit all applicable forms along with the engineering sketches and designs to the Salisbury Conservation Commission. The request will be presented to the Salisbury Conservation Commission at a scheduled public meeting for approval and with an order of conditions. If the request is subject to an enforcement action from MassDEP go to step 4.

4. Enforcement orders issued by the MassDEP will be reviewed by the DEP Northeast Regional office and approved with an order of conditions.

5. Salisbury Beach State Reservation Supervisor reviews and approves

6. DCR Northeast Regional Director reviews and approves

7. The approved plan will then be issued to the applicant with all the appropriate licenses and certifications.

8. After the approved boardwalk is installed the Salisbury Conservation Commission Administrator and the Salisbury Beach State Reservation Supervisor will inspect and sign off on the project.

9. If the project does not meet with the design and construction standards that were pre-approved the land owner will be responsible for removal of the boardwalk at the owner's expense.

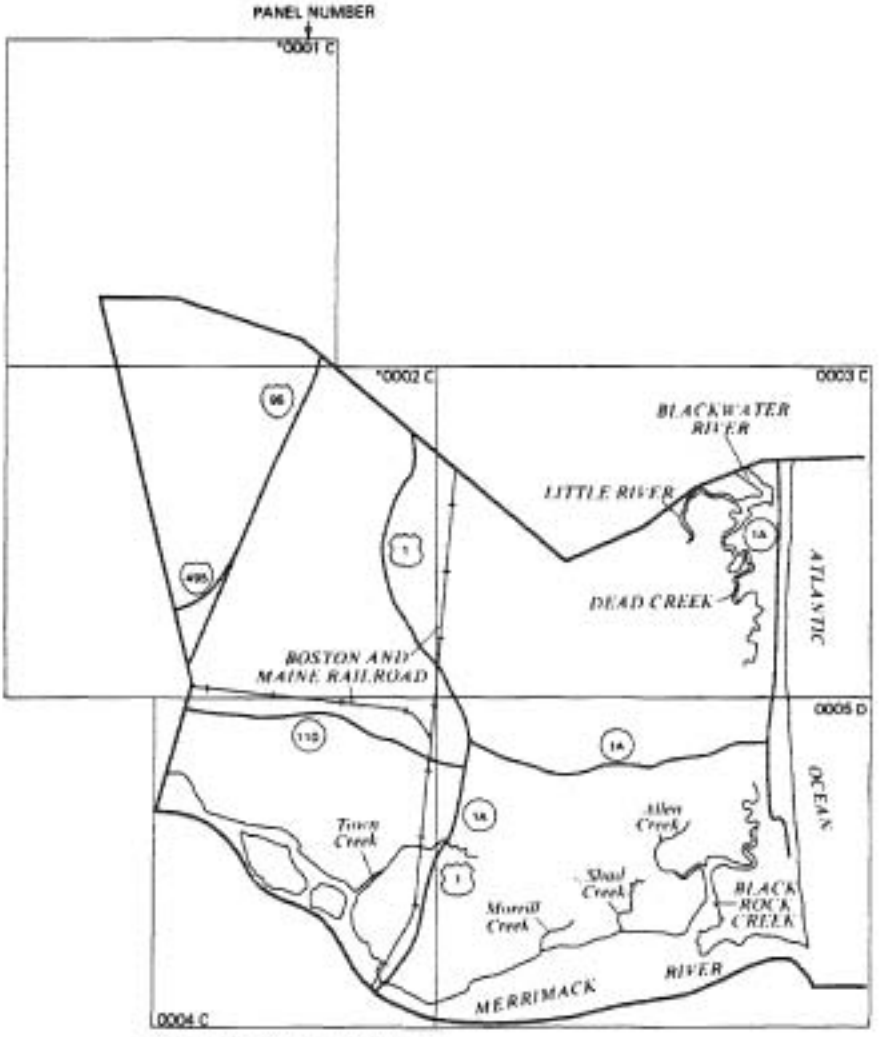
Contact Organizations Numbers

Mass DEP Northeast Region
205B Lowell Street, Wetland Section Chief
Wilmington, Massachusetts 01887
Main Phone: 978-694-3200

DCR Northeast Region
817 Lowell Street
P.O. Box 0829
Carlisle, MA 01741
Main Phone 978-369-3350

Salisbury Beach State Reservation
Beach Road Rte 1A
Salisbury, MA 01952
978-462-4481

Salisbury Conservation Commission
Town Hall
5 Beach Road
Salisbury, MA 01952
978-499-0358



*PANEL NOT PRINTED; AREA IN ZONE C

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

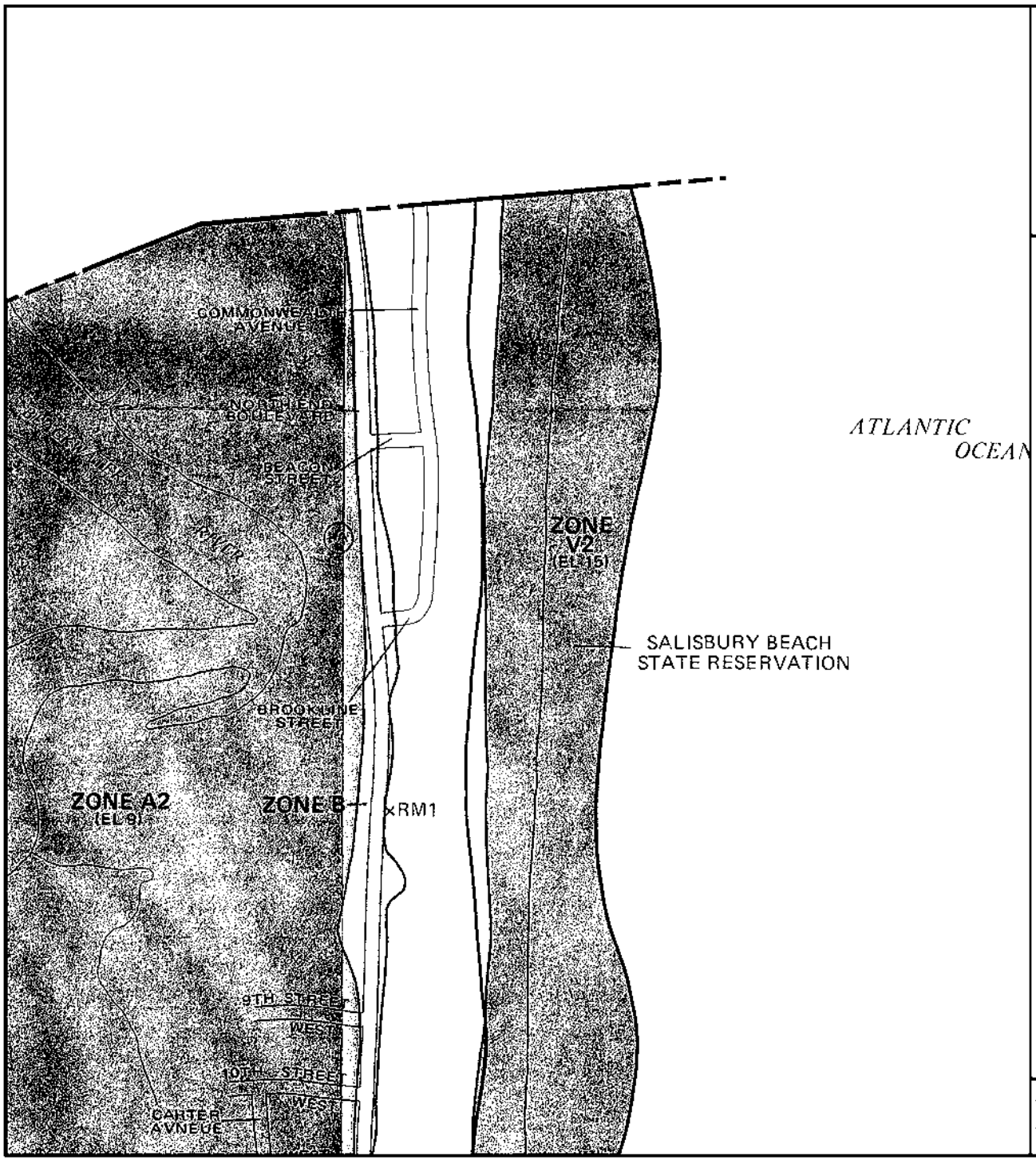
TOWN OF SALISBURY, MASSACHUSETTS
ESSEX COUNTY

MAP INDEX
PANELS PRINTED: 3, 4, 5

COMMUNITY-PANEL NUMBERS
250103 0001-0005

MAP REVISED:
JULY 2, 1992

Federal Emergency Management Agency



APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

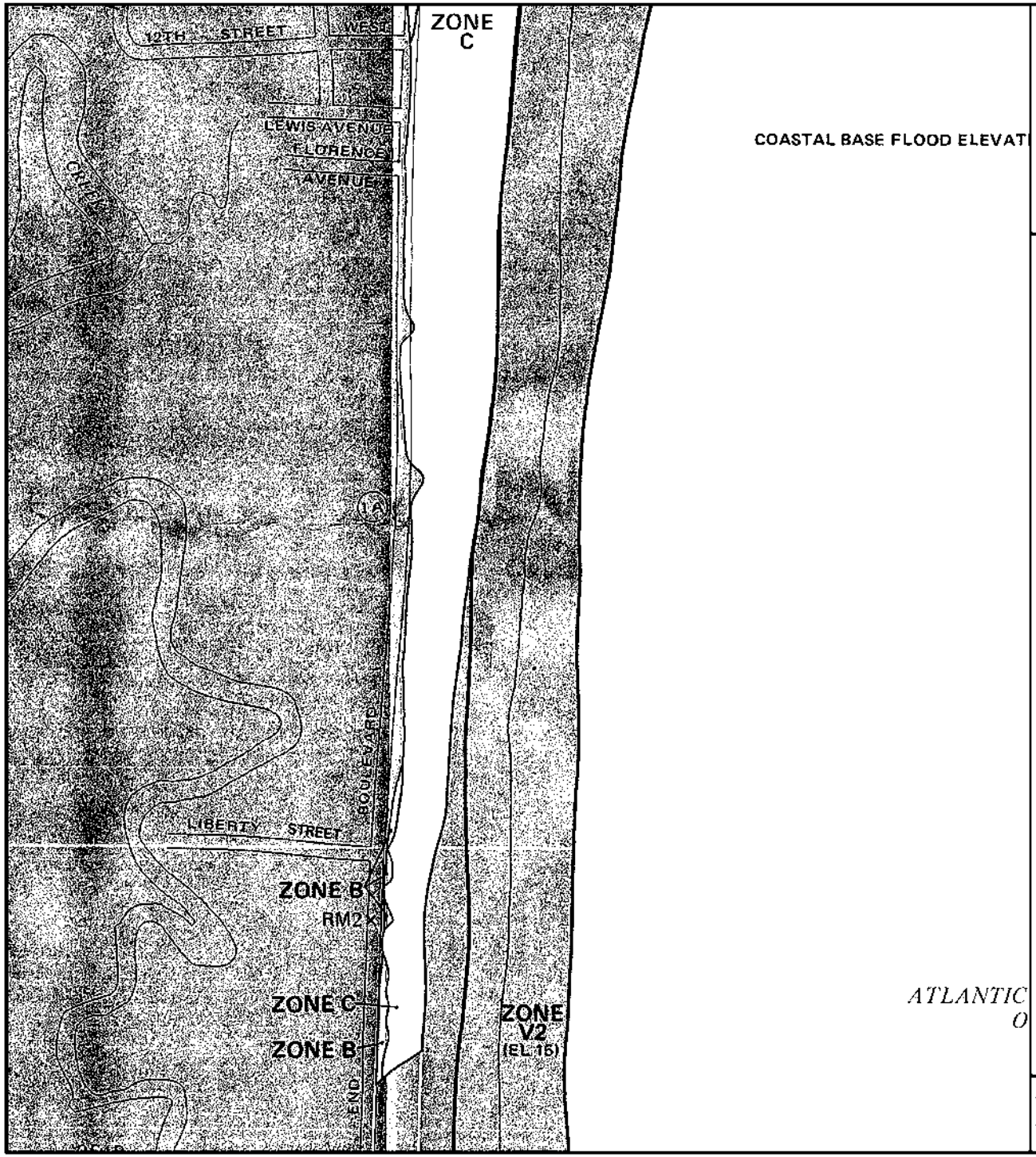
PANEL 3 OF 5

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
250103 0003 C

MAP REVISED:
SEPTEMBER 4, 1986

Federal Emergency Management Agency



APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

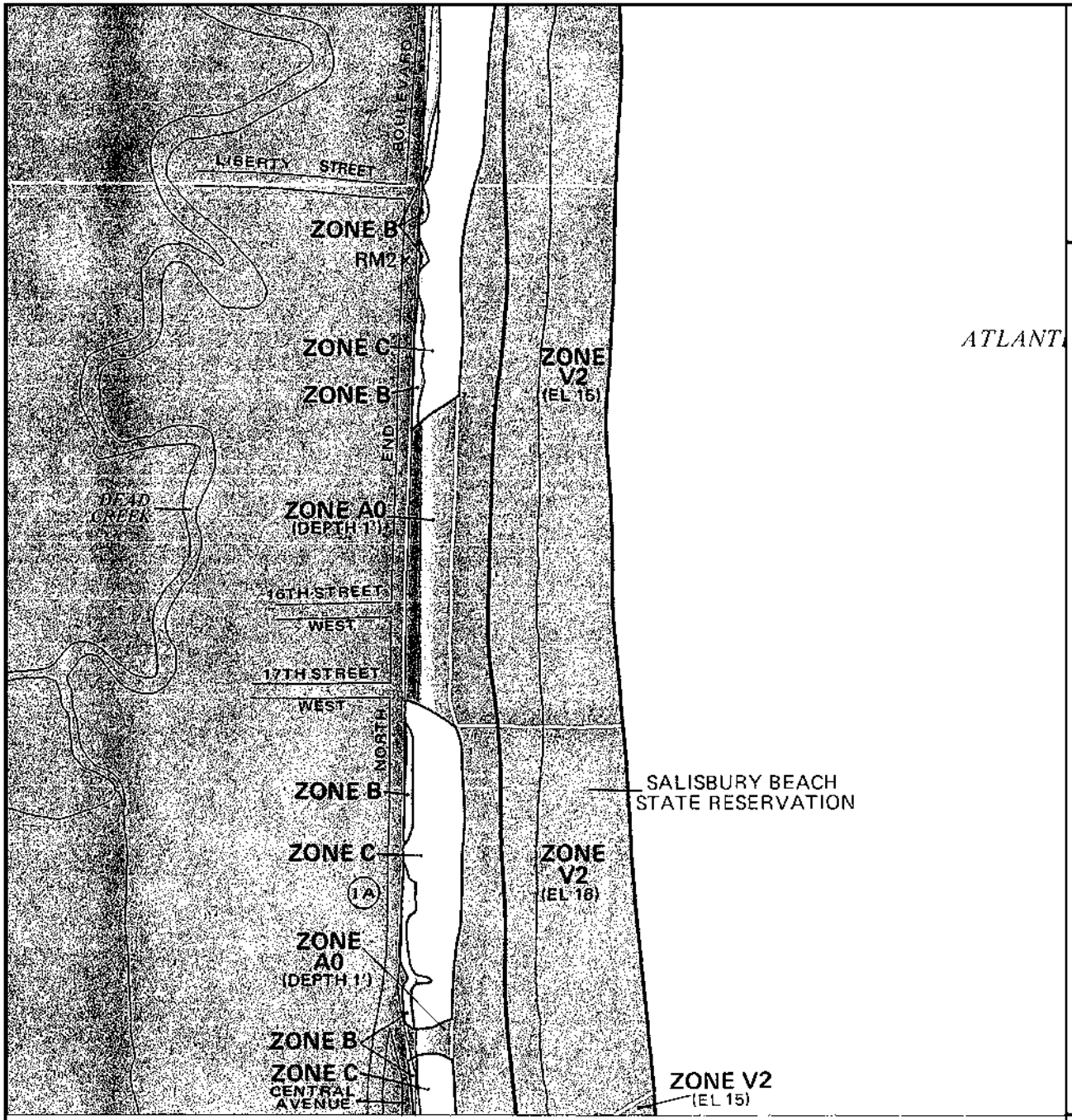
PANEL 3 OF 5

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
250103 0003 C

MAP REVISED:
SEPTEMBER 4, 1986

Federal Emergency Management Agency



APPROXIMATE SCALE

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NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

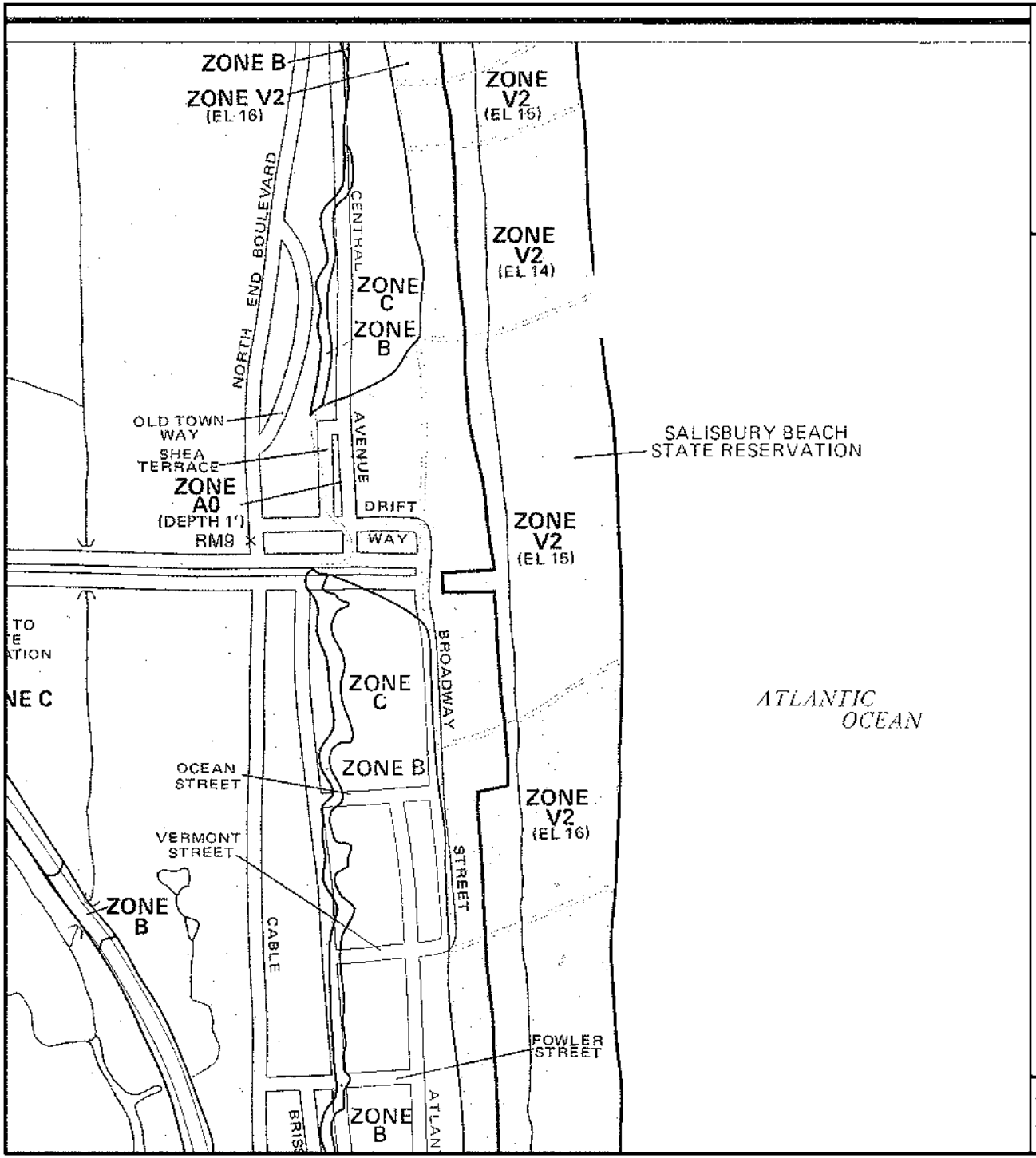
PANEL 3 OF 5

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
250103 0003 C

MAP REVISED:
SEPTEMBER 4, 1986

Federal Emergency Management Agency



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APPROXIMATE SCALE

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NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

PANEL 5 OF 5

(SEE MAP INDEX FOR PANELS NOT PRINTED)

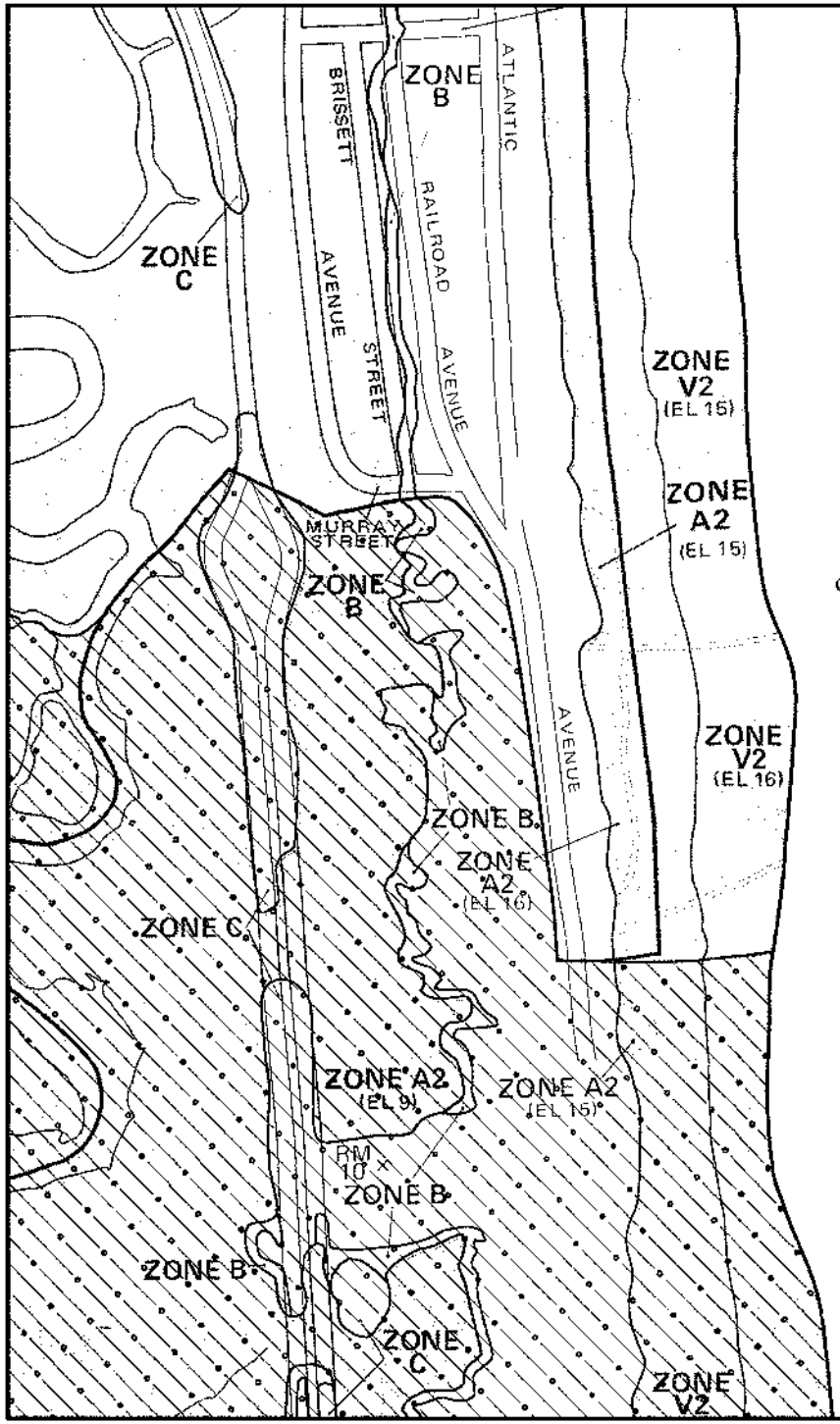
NOTE:

THIS MAP INCORPORATES APPROXIMATE BOUNDARIES OF COASTAL BARRIER RESOURCES SYSTEM UNITS AND/OR OTHERWISE PROTECTED AREAS ESTABLISHED UNDER THE COASTAL BARRIER IMPROVEMENT ACT OF 1990 (P.L. 101-591)

COMMUNITY-PANEL NUMBER
250103 0005 D

MAP REVISED:
JULY 2, 1992

Federal Emergency Management Agency



COASTAL BASE FLOOD ELEVATIONS APP

N

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

PANEL 5 OF 5

(SEE MAP INDEX FOR PANELS NOT PRINTED)

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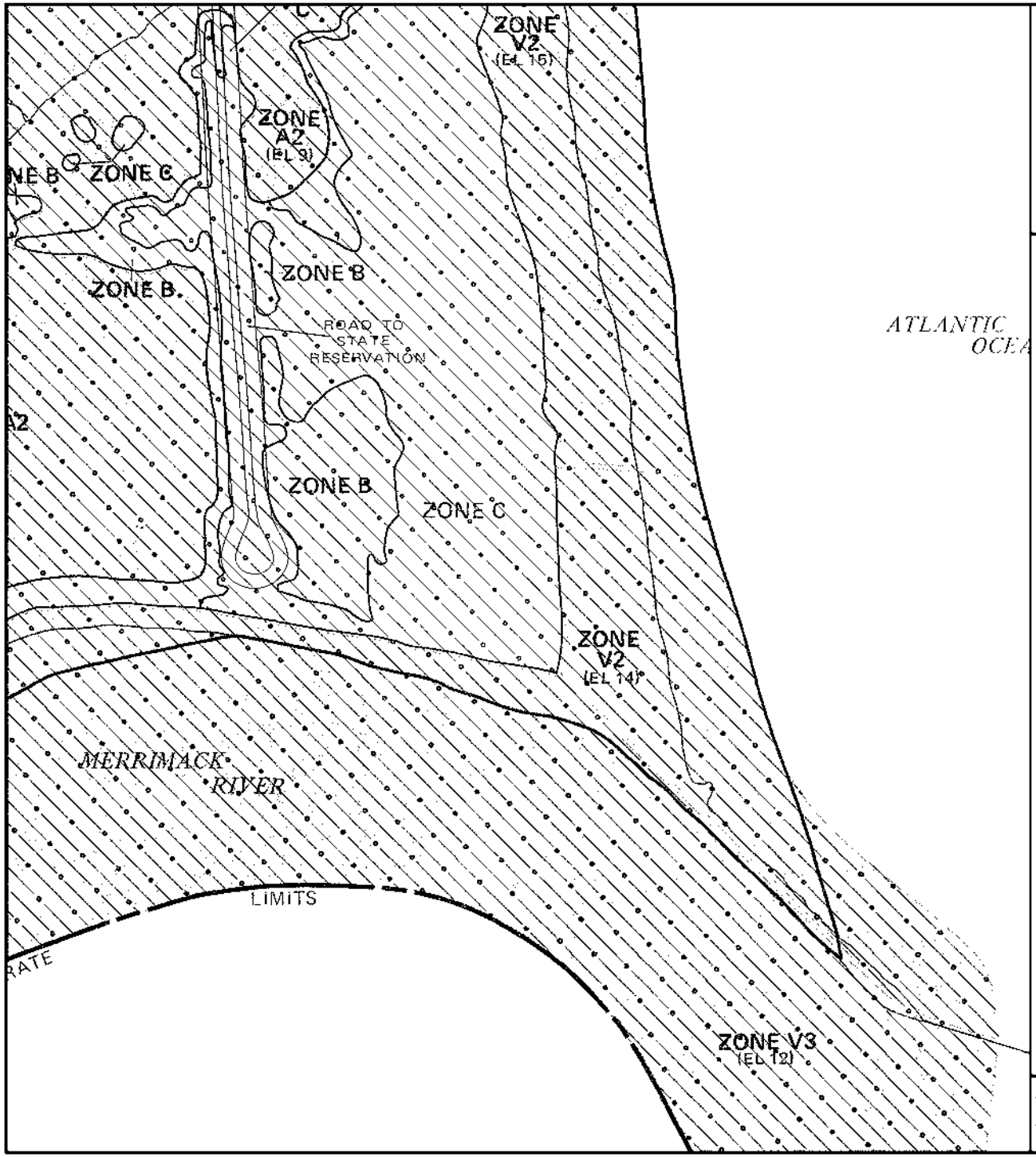

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APPROXIMATE SCALE

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NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

PANEL 5 OF 5

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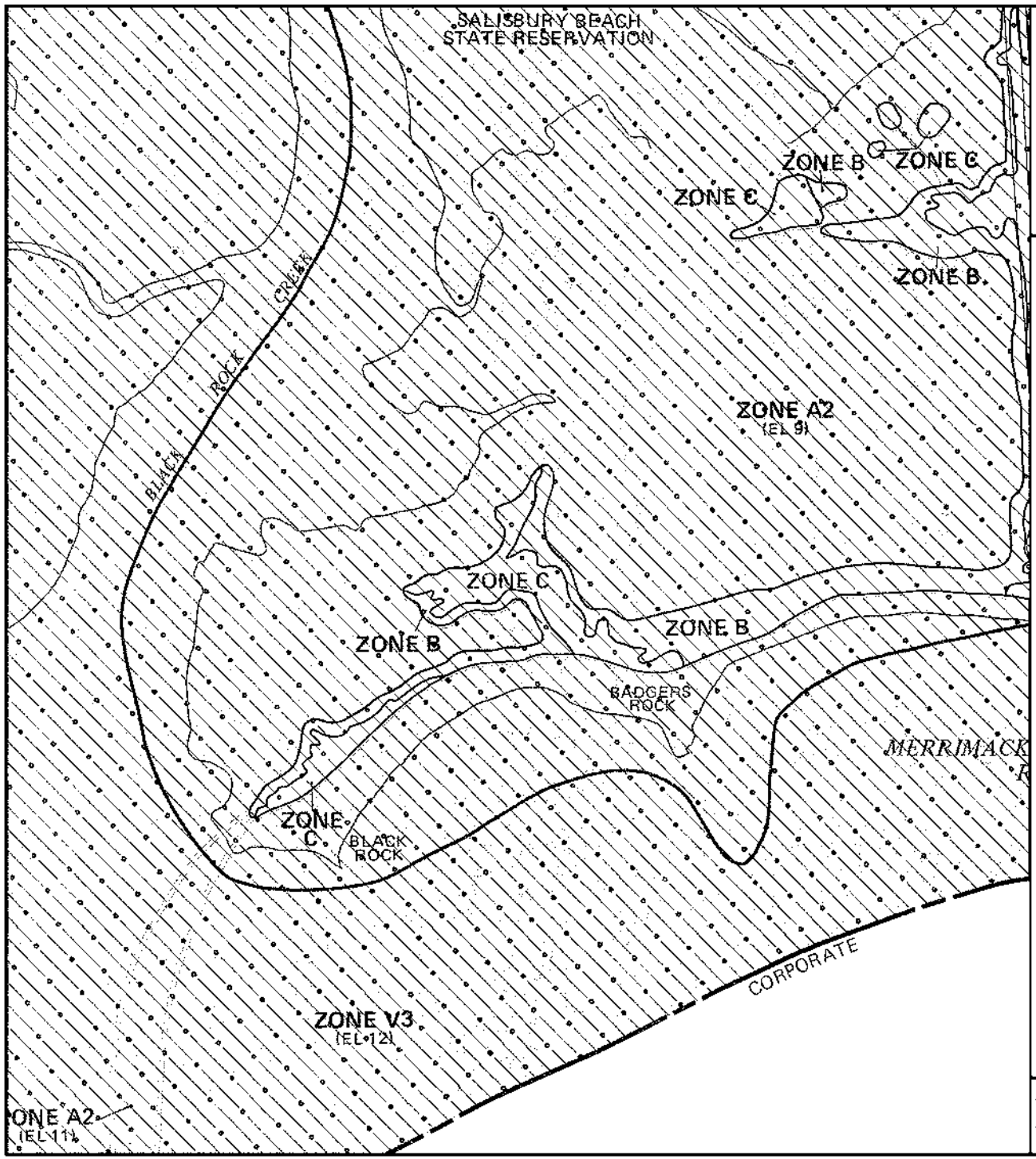

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APPROXIMATE SCALE

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NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SALISBURY,
MASSACHUSETTS
ESSEX COUNTY

PANEL 5 OF 5

(SEE MAP INDEX FOR PANELS NOT PRINTED)

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COMMUNITY-PANEL NUMBER
250103 0005 D

MAP REVISED:
JULY 2, 1992

Federal Emergency Management Agency

GUIDELINES FOR MANAGING RECREATIONAL USE OF BEACHES TO PROTECT PIPING PLOVERS, TERNS, AND THEIR HABITATS IN MASSACHUSETTS

Massachusetts Division of Fisheries and Wildlife
Natural Heritage and Endangered Species Program
Field Headquarters, Rt. 135
Westborough, MA 01581

21 April 1993

I. INTRODUCTION

The Massachusetts Division of Fisheries and Wildlife (the Division) has developed the following guidelines to assist beach managers and property owners with protecting piping plovers, least terns, common terns, roseate terns, arctic terns, and their habitats. Implementing these guidelines will help beach managers and property owners avoid potential violations of the Massachusetts Endangered Species Act (MGL c. 131A) and its implementing regulations (321 CMR 10.00) involving recreational use of beaches used by piping plovers and terns for breeding and nesting habitat.

The Division intends to apply these guidelines in its review of Notices of Intent, pursuant to the Massachusetts Wetlands Protection Act regulations (310 CMR 10.37), for vehicular use of beaches where piping plovers and terns occur.

The Department of Environmental Protection has developed a set of recommended conditions for barrier beach management to be used by municipal conservation commissions in drafting Orders of Conditions. In addition, the Massachusetts Barrier Beach Task Force, coordinated by the Office of Coastal Zone Management, has developed a comprehensive set of guidelines covering the full range of barrier beach management issues. The following guidelines should be read and applied in conjunction with these other documents.

Users of these piping plover and tern guidelines are advised that they do not supersede any law, regulation, or official policy of this or any other agency. Rather, these guidelines are intended to complement other regulatory review processes regarding recreational activities on beaches by providing a standard set of scientifically based management recommendations.

This document contains five sections: 1) an introduction, 2) summaries of life histories of these species and threats to their continued existence in the state, 3) a summary of pertinent laws and regulations, 4) guidelines for managing and protecting plovers, terns, and their habitats, and 5) literature cited.

In these guidelines, the Division has sought to provide the necessary protection to piping plovers and terns without

unnecessarily restricting appropriate access along all of the state's beaches. The Division has a long history of promoting the rights of citizens to enjoy a variety of outdoor pursuits, provided that they do not jeopardize the state's wildlife resources. The Division has worked to facilitate fishing and hunting access statewide and has supported the common law right of access to the shorelines of the coast and "Great Ponds" for the purposes of fishing and fowling. Although these guidelines make it clear that it will be necessary at times to restrict vehicular access temporarily on beaches where and when piping plovers and terns are present, the Division will only support such restrictions when it is necessary to protect the habitat, nests, and unfledged chicks of plovers and terns. The Division will continue to seek and consider management measures that offer maximum flexibility in balancing recreational use with protection of rare species and their habitats. Even when vehicular access is restricted, the Division will normally support continued access to beaches for fishermen and other recreational users by foot and by boat.

II. SPECIES STATUS, LIFE HISTORY, AND THREATS

Piping Plover

Piping plovers are small, sand-colored shorebirds that nest on sandy, coastal beaches from South Carolina to Newfoundland. The U.S. Atlantic coast population is listed as "Threatened" by the U.S. Fish and Wildlife Service under provisions of the U.S. Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1988), and was estimated at 790 pairs in 1992 (U.S. Fish and Wildlife Service 1992). In Massachusetts, the piping plover is also listed as "Threatened" by the Massachusetts Division of Fisheries and Wildlife under provisions of the Massachusetts Endangered Species Act. In 1992, 213 pairs of piping plovers nested on Massachusetts beaches (Melvin 1992).

Piping plovers nest on coastal beaches above the high-tide line, sand flats at the end of sand spits, gently sloping foredunes, and in blow-outs or washover areas between or behind coastal dunes. They may also nest where sandy dredged material has been deposited. Nests are simple scrapes in the sand or mixtures of sand, gravel, and shells. Nests are placed on open sand or in patches of sparse to moderately dense beach grass and other dune vegetation. Piping plovers depend on natural processes of beach erosion and accretion through wind and wave action to maintain suitable nesting habitat.

Piping plovers return to nesting beaches in Massachusetts

from mid-March to early May. Males establish and defend territories and court females. Nesting may occur from mid-April through late July. Clutch size is usually four eggs, and eggs are usually incubated for 27-28 days before hatching. Piping plovers fledge only a single brood per season, but may renest several times if previous nests are lost. Chicks are precocial and able to move about within hours after hatching. They may move hundreds of yards from the nest site during their first week of life. Chicks remain together with one or both parents until they fledge (are able to fly) at 25 to 35 days of age. Depending on date of hatching, unfledged chicks may be present from late May until mid-August, although most fledge by the end of July. Adults and chicks feed on amphipods, marine worms, flies, and other invertebrates. The most important feeding habitats for both adults and chicks are intertidal areas and wrack (seaweed, vegetation, shells, and other organic debris deposited on the beach by tides and storms) (Gibbs 1986, Goldin et al. 1990, Hoopes et al. 1992).

Sandy beaches that provide nesting habitat for piping plovers are also attractive recreational habitats for people and their pets. Human recreational activities can be a source of both disturbance and direct mortality to piping plovers (Blodget 1990, Melvin et al. 1991). People on beaches may inadvertently crush eggs, cause nests to be abandoned, and disturb or displace unfledged chicks. Unleashed dogs may chase adults, kill chicks, and eat eggs. Kites and fireworks are highly disturbing to piping plovers (Hoopes et al. 1992; Howard et al. 1993).

Unrestricted use of motorized vehicles on beaches is a serious threat to piping plovers and their habitats. Vehicles can crush both eggs and chicks (Burger 1986, Patterson 1988, Strauss 1990, Melvin et al. 1991). In Massachusetts, biologists documented 7 incidents in which 9 chicks were killed by vehicles between 1989 and 1992 (Melvin et al. 1993). Many biologists that monitor and manage piping plovers believe that many more chicks are killed by vehicles than are found and reported. On sections of Massachusetts beaches used by vehicles during nesting and brood-rearing periods, breeding plovers are generally either absent or less abundant than expected given available nesting and feeding habitat. In contrast, plover abundance and productivity has increased on beaches where vehicle restrictions during chick-rearing periods have been combined with protection of nests from predators.

Typical behaviors of piping plover chicks increase their vulnerability to vehicles (Melvin et al. 1993). Chicks frequently move between the upper berm or foredune and feeding habitats in the wrack line and intertidal zone. These movements place chicks in the paths of vehicles driving along the berm or

through the intertidal zone. Chicks stand in, walk, and run along tire ruts, and sometimes have difficulty crossing deep ruts or climbing out of them. Chicks sometimes stand motionless or crouch as vehicles pass by, or do not move quickly enough to get out of the way. Wire fencing placed around nests to deter predators is ineffective in protecting chicks from vehicles because chicks typically leave the nest within a day after hatching and move extensively along the beach to feed.

Vehicles also degrade piping plover habitat by crushing wrack into the sand and making it unavailable as cover or a foraging substrate, by creating ruts that may trap or impede movements of chicks, and by causing disturbance that may prevent plovers from using habitat that is otherwise suitable (Goldin et al. 1990, Strauss 1990, Melvin et al. 1993).

Least Tern

Least terns are small, white and black seabirds that nest along Atlantic coast beaches from southern Maine to Florida. The least tern is listed as a "Species of Special Concern" by the Division of Fisheries and Wildlife under provisions of the Massachusetts Endangered Species Act. An estimated 2,642 pairs nested at 51 sites in Massachusetts in 1992 (Blodget 1992).

Least terns nest in habitats that are similar to those of the piping plover, and the two species often nest near each other. Least terns arrive in Massachusetts in early May, engage in elaborate courtship rituals, mate, and quickly establish nesting colonies. Actual nesting occurs from about the third week of May to mid-July. Nesting colonies range in size from several pairs to over 500 pairs. Nests are shallow "scrapes" in the sand, usually in sandy areas devoid of vegetation, but sometimes in areas of sparse beach grass, beach pea, and other dune vegetation. Least terns, like piping plovers, have nested along the Atlantic coast for thousands of years and depend on natural processes of beach and dune erosion and accretion to maintain their habitats.

Clutches consist of 1-3 eggs and incubation averages 21 to 23 days. Least terns are single-brooded, but will renest multiple times if previous nests are lost. Chicks are precocial and may move considerable distances along the beach before fledging, which occurs after 20-22 days. Adults deliver fish caught in the surrounding waters to chicks. Soon after chicks are able to fly, least terns gather in pre-migratory flocks and depart southward; most are gone before the end of August.

Least terns are vulnerable to disturbance from humans, pets,

and vehicles during periods of courtship and egg-laying in May and June. Similar to piping plovers, incubating least tern adults, eggs, and chicks are extremely cryptic. Prolonged or repeated disturbance at colonies can lead to egg and chick loss from exposure, predation, or abandonment. Least tern chicks are also vulnerable to mortality caused by off-road vehicles, and may stand or crouch in or walk and run along vehicle ruts.

Common, Roseate, and Arctic Terns

These three similar species of white and black seabirds nest together in mixed-species colonies. All are slightly larger than the least tern. The common tern is indeed the most "common" of the group. In 1992, 8,600 pairs were estimated at 35 sites in Massachusetts, although only 9 of those colonies exceeded 100 pairs (Blodget 1992). The arctic tern, at the southern edge of its natural range in Massachusetts, has been declining since the 1950's and reached an all-time low of only 8 pairs in 1992. Both of these species are listed by the Massachusetts Division of Fisheries and Wildlife as "Species of Special Concern" under provisions of the Massachusetts Endangered Species Act.

The Northeastern population of the roseate tern is listed as "Endangered" by both the U.S. Fish and Wildlife Service under the U.S. Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1989), and the Massachusetts Division of Fisheries and Wildlife under provisions of the Massachusetts Endangered Species Act. Of an estimated 1,412 pairs in Massachusetts in 1992, 1,375 pairs (97%) nested on Bird Island in Buzzards Bay (Blodget 1992). The rest were scattered among large colonies of common terns.

These three species of larger terns prefer to nest on offshore islands and remote tips of barrier beaches. Unfortunately, gulls have usurped most optimal nesting sites since the 1950's, forcing terns to nest at a limited number of secondary inshore sites where they are more exposed to human disturbance and a host of land-based predators.

The life histories of these three species of terns are generally similar. Exemplifying the three, common terns select dune areas with moderate to dense stands of beach grass and other dune vegetation. Birds arrive from the south in early May and select colony sites before the end of May. Ritualized courtship and pair formation occur on the beach and sandflats adjacent to the colony site. Nesting colonies range from a few to over 4,000 pairs. Nests are usually scrapes in the sand lined with beach grass and seaweed. Clutches of 2-3 eggs are laid and both parents share incubation duties for about 23 days. Young are precocial but are fed and brooded by adults. Diets of these

terns are almost exclusively fish. As the young approach fledging at about 28 days, they congregate in rearing or "nursery" areas on broad expanses of beach and sand flats, where they loaf and are fed by adults. At some sites, thousands of young terns may be present in these nursery areas from late July through mid-August. After mid-August, most terns have fledged and all three species gather at staging areas prior to departing for winter quarters by the end of August.

Prolonged or repeated disturbance at nesting colonies or nursery areas of common, arctic, or roseate terns can lead to egg and chick loss from exposure, predation, or abandonment. Eggs and young chicks tend to be less subject to mortality from vehicles because they occur more often in dune areas, but older chicks are sometimes run over when they move onto the outer beach prior to fledging. Older chicks have also been found dead, tangled in kite string.

III. MASSACHUSETTS LAW

This section is provided to give a brief overview of provisions of the Massachusetts Wetlands Protection Act and Endangered Species Act that are pertinent to the management of piping plovers, terns, and their habitats. The reader is strongly advised to read the official texts of the current laws and regulations cited below.

Massachusetts Wetlands Protection Act (MGL c. 131 s. 40)

The Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife (the Program) acts as the scientific authority to determine what is actual habitat and to provide an opinion about whether proposed activities subject to the Wetlands Protection Act will have adverse effects on rare wetlands wildlife habitat. Opinions issued by the Program are presumed to be correct, although this presumption is rebuttable and may be overcome upon a clear showing to the contrary.

Massachusetts Endangered Species Act (MGL c. 131A)

The Massachusetts Endangered Species Act (MESA) and regulations (321 CMR 10.00) are administered by the Massachusetts Division of Fisheries and Wildlife. The Act prohibits the "taking" of any species of animal or plant listed as

"Endangered", "Threatened", or "Species of Special Concern" in Massachusetts. For animals, "taking" is defined as: "to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding, or migratory activity or attempt to engage in any such conduct, or to assist such conduct". Regulations implementing the Act state further that: "All state agencies shall utilize their authorities in furtherance of the purposes of MESA and these regulations; review, evaluate and determine the impact on Endangered, Threatened and Special Concern species or their habitats of all works, projects, or activities conducted by them; and use all practicable means and measures to avoid or minimize damage to such species or their habitats." This includes "any work, project, or activity either directly undertaken by a state agency, or if undertaken by a person, which seeks the provision of financial assistance by an agency or requires the issuance of permits by an agency".

IV. MANAGEMENT GUIDELINES

VEHICLE MANAGEMENT

Protection of Nests and Nesting Habitat

On beaches where vehicles will be driven, all areas of suitable piping plover nesting habitat, as determined by the Division, should be identified and delineated with posts and warning signs or symbolic fencing on or before April 1 each year. Suitable nesting habitat for all species of terns should be identified and so delineated on or before May 15 each year.

All vehicular access into or through delineated nesting habitat should be prohibited. However, prior to hatching, vehicles may pass by such areas along designated vehicle corridors established along the outside edge of plover and tern nesting habitat. Vehicles may also park outside delineated nesting habitat, if beach width and configuration and tidal conditions allow. Vehicle corridors or parking areas should be moved, constricted, or temporarily closed if territorial, courting, or nesting plovers or terns are disturbed by passing or parked vehicles, or if disturbance is anticipated because of unusual tides or expected increases in vehicle use during weekends, holidays, or special events.

Massachusetts Division of Fisheries and Wildlife
Piping Plover and Tern Guidelines
21 April 1993

Protection of Chicks and Chick Habitat

Sections of beaches where unfledged piping plover or tern chicks are present should be temporarily closed to all vehicles not deemed essential. (See the provisions for essential vehicles below.)

When unfledged plover chicks are present, vehicles should be prohibited from all dune, beach, and intertidal habitat within 100 yards of either side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 200 yard-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. If unfledged plover chicks move outside the original 200 yard-wide area of protected habitat, then the boundaries of the protected area should be adjusted to provide at least a 100 yard buffer between chicks and vehicles.

When unfledged least tern chicks are present, vehicles should be prohibited from all dune, beach, and intertidal habitat within 100 yards of either side of lines drawn through the outermost nests in the colony and perpendicular to the long axis of the beach. The resulting area of protected habitat for least tern chicks should extend from the ocean-side low water line to the bay-side low water line, or to the farthest extent of dune habitat if no bay-side intertidal zone exists. If unfledged chicks move outside the original protected area, then the boundaries of the protected area should be adjusted to provide at least a 100 yard-wide buffer between unfledged chicks and vehicles. However, vehicles may pass through any portions of the protected area considered inaccessible to least tern chicks because of distance, steep topography, dense vegetation, or other naturally-occurring obstacles. Because least tern chicks disperse from nests shorter distances and at older ages than piping plover chicks, under some circumstances it may be possible to allow passage of vehicles through portions of protected least tern chick habitat if, in the opinion of the Division, this can occur without substantially increasing threats to least tern chicks or their habitats.

Timing of Vehicle Restrictions in Chick Habitat

Restrictions on use of vehicles in areas where unfledged plover or tern chicks are present should begin on or before the

date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in flight, whichever occurs first. Tern chicks are considered fledged when they are capable of flight.

When piping plover nests are found before the last egg is laid, restrictions on vehicles should begin on the 26th day after the last egg is laid. This assumes an average incubation period of 27 days, and provides a 1 day margin of error.

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on a date determined by 1 of 3 scenarios:

1) If a plover nest found with a complete clutch is monitored twice per day, at dawn and dusk (before 0600 hrs and after 1900 hrs), vehicle use may continue until hatching begins. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers.

2) If a plover nest is found with a complete clutch before May 22 (the earliest recorded hatch date for piping plovers in Massachusetts), and is not monitored twice per day, at dawn and dusk, then restrictions on vehicles should begin May 22.

3) If a plover nest is found with a complete clutch on or after May 22, and is not monitored twice per day, at dawn and dusk, then restrictions on vehicles should begin immediately.

If hatching occurs earlier than expected, or chicks are discovered from an unreported nest, restrictions on vehicles should begin immediately.

If, in the opinion of the Division, ruts are present that are deep enough to restrict movements of plover chicks, or vehicle impacts on wrack are so severe that wrack must be allowed to accumulate naturally prior to hatching, then restrictions on vehicles should begin at least 5 days prior to the anticipated hatching date of plover nests. If a plover nest is found with a complete clutch, precluding estimation of hatching date, and availability of wrack has been substantially reduced by vehicle passage, or deep ruts have been created that could reasonably be expected to impede chick movements, then restrictions on vehicles should begin immediately.

Massachusetts Division of Fisheries and Wildlife
Piping Plover and Tern Guidelines
21 April 1993

Restrictions on use of vehicles in least tern chick habitat should begin as soon as hatching begins (as early as June 12). Restrictions may begin later if, in the opinion of the Division, tern chicks are not endangered by vehicles because of distance or intervening steep terrain, dense vegetation, or other naturally-occurring barriers.

Areas of dune, beach, or intertidal habitat used as nursery areas by unfledged or recently fledged tern chicks, as identified by the Division, should be delineated with posts, warning signs or symbolic fencing not later than June 21. All access by vehicles into posted tern nursery areas should be prohibited while unfledged or recently-fledged tern chicks are present in these areas, until it is determined that use of nursery areas by young terns has ended (i.e. young terns are no longer being fed by adult terns).

Essential Vehicles

Essential vehicles, as defined by municipal conservation commissions pursuant to the Guidelines for Barrier Beach Management in Massachusetts developed by the Massachusetts Barrier Beach Task Force, should only travel on sections of beaches where unfledged plover or tern chicks are present if such travel is absolutely necessary and no other reasonable travel routes are available. Essential vehicles should travel through chick habitat areas only during daylight hours, except in emergencies, and should be guided by a qualified monitor who has first determined the location of all unfledged plover and tern chicks. All steps should be taken to minimize number of trips by essential vehicles through chick habitat areas. Use of open, 3 or 4-wheel motorized all-terrain vehicles (ATVs) or non-motorized all-terrain bicycles is recommended whenever possible for monitoring and law enforcement because of the improved visibility afforded operators. Homeowners should consider other means of access, eg. by foot, water, or shuttle services, during periods when chicks are present. A log should be maintained by the beach manager of the date, time, vehicle number and operator, and purpose of each trip through areas where unfledged chicks are present. Personnel monitoring plovers and terns should maintain and regularly update a log of the numbers and locations of unfledged plover and tern chicks on each beach. Drivers of essential vehicles should review the log each day to determine the most recent number and location of unfledged chicks.

Travel by essential vehicles should avoid the wrack line and should be infrequent enough to avoid creating deep ruts that could impede chick movements. If essential vehicles are substantially reducing availability of wrack or are creating ruts

that could impede chick movements, use of essential vehicles should be further reduced and, if necessary, restricted to only emergency vehicles.

MANAGEMENT OF OTHER RECREATIONAL USES

The activities discussed in this section are not subject to the jurisdiction of the Wetlands Protection Act because they are not considered to be alterations of wetland resource areas. The following guidelines should only be applied in reference to the Massachusetts Endangered Species Act.

On beaches where pedestrians, joggers, sun-bathers, picnickers, fishermen, boaters, horseback riders, or other recreational users will be present in numbers that could harm or disturb incubating plovers or terns, their eggs, or chicks, refuge areas of at least 50 yard-radius around nests and above the high tide line should be delineated with warning signs and symbolic fencing. Only persons engaged in rare species monitoring, management, or research activities should enter refuge areas. Refuge areas should remain fenced as long as viable eggs or unfledged chicks are present.

Refuge areas around nests should be expanded if a 50 yard-radius is deemed inadequate to protect incubating adults or unfledged chicks from harm or disturbance. This may include situations where plovers or terns are especially intolerant of human presence, or where a 50 yard-radius refuge provides insufficient escape cover or alternative foraging opportunities for plover chicks. If nests are discovered outside fenced areas, fencing should be extended to create a sufficient buffer to prevent harm or disturbance to incubating adults, eggs, or unfledged chicks. On some beaches where plovers and terns have traditionally nested or where suitable habitat occurs, it may be necessary to symbolically fence portions of habitat during March or April, prior to plover nesting, or during May, prior to tern nesting, if, in the opinion of the Division, failure to do so could discourage plovers or terns from nesting as a result of disturbance from human use.

Rearing or nursery areas used by unfledged or recently fledged tern chicks, as identified by the Division, should be delineated with posts, warning signs, or symbolic fencing not later than June 21. Only persons engaged in rare species monitoring, management, or research should enter posted or fenced tern nursery areas while unfledged tern chicks or tern chicks being fed by adult terns are present, although individuals may pass by outside these areas. Such nursery areas may be re-opened

when all tern chicks have fledged and are not being fed by adult terns.

Pets should be leashed and under control of their owners at all times from April 1 to August 31 on beaches where piping plovers or terns are present or have traditionally nested. Pets should be prohibited on these beaches from April 1 through August 31 if, based on observations and experience, pet owners fail to keep pets leashed and under control.

Kite flying should be prohibited within 200 yards of nesting or territorial adult or unfledged juvenile piping plovers or terns, from April 1 to August 31.

Fireworks should be prohibited on beaches where plovers or terns nest from April 1 to August 31.

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Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act

Northeast Region, U.S. Fish and Wildlife Service
April 15, 1994

(Also see additional Service guidance on fireworks and in the 1996 Revised Recovery Plan.)

The following information is provided as guidance to beach managers and property owners seeking to avoid potential violations of Section 9 of the Endangered Species Act (16 U.S.C. 1538) and its implementing regulations (50 CFR Part 17) that could occur as the result of recreational activities on beaches used by breeding piping plovers along the Atlantic Coast. These guidelines were developed by the Northeast Region, U.S. Fish and Wildlife Service (Service), with assistance from the U.S. Atlantic Coast Piping Plover Recovery Team. The guidelines are advisory, and failure to implement them does not, of itself, constitute a violation of the law. Rather, they represent the Service's best professional advice to beach managers and landowners regarding the management options that will prevent direct mortality, harm, or harassment of piping plovers and their eggs due to recreational activities.

Some land managers have endangered species protection obligations under Section 7 of the Endangered Species Act (see section I below) or under Executive Orders 11644 and 11989[(1)] that go beyond adherence to these guidelines. Nothing in this document should be construed as lack of endorsement of additional piping plover protection measures implemented by these land managers or those who are voluntarily undertaking stronger plover protection measures.

This document contains four sections: (I) a brief synopsis of the legal requirements that afford protection to nesting piping plovers; (II) a brief summary of the life history of piping plovers and potential threats due to recreational activities during the breeding cycle; (III) guidelines for protecting piping plovers from recreational activities on Atlantic Coast beaches; and (IV) literature cited.

I. LEGAL CONSIDERATIONS

Section 9 of the Endangered Species Act (ESA) prohibits any person subject to the jurisdiction of the United States from harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting listed wildlife species. It is also unlawful to attempt such acts, solicit another to commit such acts, or cause such acts to be committed. A "person" is defined in Section 3 to mean "an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or

political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States." Regulations implementing the ESA (50 CFR 17.3) further define "harm" to include significant habitat modification or degradation that results in the killing or injury of wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Penalties for violations of Section 9 are provided in Section 11 of the ESA; for threatened species, these penalties include fines of up to $25,000, imprisonment for not more than six months, or both.

Section 10 of the ESA and related regulations provide for permits that may be granted to authorize acts prohibited under Section 9, for scientific purposes or to enhance the propagation or survival of a listed species. States that have Cooperative Agreements under Section 6 of the ESA, may provide written authorization for take that occurs in the course of implementing conservation programs. For example, State agencies have authorized certain biologists to construct predator exclosures for piping plovers. It is also legal for employees or designated agents of certain Federal or State agencies to take listed species without a permit, if the action is necessary to aid sick, injured, or orphaned animals or to salvage or dispose of a dead specimen.

Section 10 also allows permits to be issued for take that is "incidental to, and not the purpose of, carrying out an otherwise lawful activity" if the Service determines that certain conditions have been met. An applicant for an incidental take permit must prepare a conservation plan that specifies the impacts of the take, steps the applicant will take to minimize and mitigate the impacts, funding that will be available to implement these steps, alternative actions to the take that the applicant considered, and the reasons why such alternatives are not being utilized.

Section 7 of the ESA may be pertinent to beach managers and landowners in situations that have a Federal nexus. Section 7 requires Federal agencies to consult with the Service (or National Marine Fisheries Service for marine species) prior to authorizing, funding, or carrying out activities that may affect listed species. Section 7 also requires that these agencies use their authorities to further the conservation of listed species. Section 7 obligations have caused Federal land management agencies to implement piping plover protection measures that go beyond those required to avoid take, for example by conducting research on threats to piping plovers. Other examples of Federal activities that may affect piping plovers along the Atlantic Coast, thereby triggering Section 7 consultation, include permits for beach nourishment or disposal of dredged material (U.S. Army Corps of Engineers) and funding of beach restoration projects (Federal Emergency Management Authority).

Piping plovers, as well as other migratory birds such as least terns, common terns, American oystercatchers, laughing gulls, herring gulls, and great black-blacked gulls, their nests, and eggs are also protected under the Migratory Bird Treaty Act of 1918 (16

U.S.C. 703-712). Prohibited acts include pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting such conduct. Violators may be fined up to $5000 and/or imprisoned for up to six months.

Almost all States within the breeding range of the Atlantic Coast piping plover population list the species as State threatened or endangered (Northeast Nongame Technical Committee 1993). Various laws and regulations may protect State-listed species from take, but the Service has not ascertained the adequacy of the guidelines presented in this document to meet the requirements of any State law.

II. LIFE HISTORY AND THREATS FROM HUMAN DISTURBANCE

Piping plovers are small, sand-colored shorebirds that nest on sandy, coastal beaches from South Carolina to Newfoundland. Since 1986, the Atlantic Coast population has been protected as a threatened species under provisions of the U.S. Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1985). The U.S. portion of the population was estimated at 875 pairs in 1993 (U.S. Fish and Wildlife Service 1993). Many characteristics of piping plovers contribute to their susceptibility to take due to human beach activities.

LIFE HISTORY

Piping plovers begin returning to their Atlantic Coast nesting beaches in mid-March (Coutu et al. 1990, Cross 1990, Goldin 1990, MacIvor 1990, Hake 1993). Males establish and defend territories and court females (Cairns 1982). Eggs may be present on the beach from mid-April through late July. Clutch size is generally four eggs, and the incubation period[(2)] usually lasts for 27-28 days. Piping plovers fledge only a single brood per season, but may renest several times if previous nests are lost. Chicks are precocial[(3)] (Wilcox 1959, Cairns 1982). They may move hundreds of yards from the nest site during their first week of life (see Table 1, Summary of Chick Mobility Data). Chicks remain together with one or both parents until they fledge (are able to fly) at 25 to 35 days of age. Depending on date of hatching, flightless chicks may be present from mid-May until late August, although most fledge by the end of July (Patterson 1988, Goldin 1990, MacIvor 1990, Howard et al. 1993).

Piping plover nests are situated above the high tide line on coastal beaches, sand flats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and washover areas cut into or between dunes. They may also nest on areas where suitable dredge material has been deposited. Nest sites are shallow scraped depressions in substrates ranging from fine grained sand to mixtures of sand and pebbles, shells or cobble (Bent 1929, Burger 1987a, Cairns 1982, Patterson 1988, Flemming et al. 1990, MacIvor 1990, Strauss 1990). Nests are usually found in areas with little or no vegetation although, on occasion, piping plovers will nest under stands of American beachgrass (*Ammophila breviligulata*) or other vegetation (Patterson 1988, Flemming et al. 1990, MacIvor 1990). Plover nests may be very difficult to detect, especially during the 6-7 day egg-laying phase when the birds generally do not incubate (Goldin 1994).

Plover foods consist of invertebrates such as marine worms, fly larvae, beetles, crustaceans or mollusks (Bent 1929, Cairns 1977, Nicholls 1989). Feeding areas include intertidal portions of ocean beaches, washover areas, mudflats, sandflats, wrack lines[(4)], and shorelines of coastal ponds, lagoons or salt marshes (Gibbs 1986, Coutu et al. 1990, Hoopes et al. 1992, Loegering 1992, Goldin 1993). Studies have shown that the relative importance of various feeding habitat types may vary by site (Gibbs 1986, Coutu et al. 1990, McConnaughey et al. 1990, Loegering 1992, Goldin 1993, Hoopes 1993) and by stage in the breeding cycle (Cross 1990). Adults and chicks on a given site may use different feeding habitats in varying proportion (Goldin et al. 1990). Feeding activities of chicks may be particularly important to their survival. Cairns (1977) found that piping plover chicks typically tripled their weight during the first two weeks post-hatching; chicks that failed to achieve at least 60% of this weight gain by day 12 were unlikely to survive. During courtship, nesting, and brood rearing, feeding territories are generally contiguous to nesting territories (Cairns 1977), although instances where brood-rearing areas are widely separated from nesting territories are not uncommon (see Table 1). Feeding activities of both adults and chicks may occur during all hours of the day and night (Burger 1993) and at all stages in the tidal cycle (Goldin 1993, Hoopes 1993).

THREATS FROM NONMOTORIZED BEACH ACTIVITIES

Sandy beaches that provide nesting habitat for piping plovers are also attractive recreational habitats for people and their pets. Nonmotorized recreational activities can be a source of both direct mortality and harassment of piping plovers. Pedestrians on beaches may crush eggs (Burger 1987b, Hill 1988, Shaffer and Laporte 1992, Cape Cod National Seashore 1993, Collazo et al. 1994). Unleashed dogs may chase plovers (McConnaughey et al. 1990), destroy nests (Hoopes et al. 1992), and kill chicks (Cairns and McLaren 1980).

Pedestrians may flush incubating plovers from nests (see Table 2, Summary of Data on Distances at Which Plovers React to Disturbance), exposing eggs to avian predators or causing excessive cooling or heating of eggs. Repeated exposure of shorebird eggs on hot days may cause overheating, killing the embryos (Bergstrom 1991). Excessive cooling may kill embryos or retard their development, delaying hatching dates (Welty 1982). Pedestrians can also displace unfledged chicks (Strauss 1990, Burger 1991, Hoopes et al. 1992, Loegering 1992, Goldin 1993). Fireworks are highly disturbing to piping plovers (Howard et al. 1993). Plovers are particularly intolerant of kites, compared with pedestrians, dogs, and vehicles; biologists believe this may be because plovers perceive kites as potential avian predators (Hoopes et al. 1992).

THREATS FROM MOTOR VEHICLES

Unrestricted use of motorized vehicles on beaches is a serious threat to piping plovers and their habitats. Vehicles can crush eggs (Wilcox 1959; Tull 1984; Burger 1987b; Patterson et al. 1991; United States of America v. Breezy Point Cooperative, Inc., U.S. District Court, Eastern District of New York, Civil Action No. CV-90-2542, 1991; Shaffer and Laporte 1992), adults, and chicks. In Massachusetts and New York,

biologists documented 14 incidents in which 18 chicks and 2 adults were killed by vehicles between 1989 and 1993 (Melvin et al. 1994). Goldin (1993) compiled records of 34 chick mortalities (30 on the Atlantic Coast and 4 on the Northern Great Plains) due to vehicles. Many biologists that monitor and manage piping plovers believe that many more chicks are killed by vehicles than are found and reported (Melvin et al. 1994). Beaches used by vehicles during nesting and brood-rearing periods generally have fewer breeding plovers than available nesting and feeding habitat can support. In contrast, plover abundance and productivity has increased on beaches where vehicle restrictions during chick-rearing periods have been combined with protection of nests from predators (Goldin 1993; S. Melvin, pers. comm., 1993).

Typical behaviors of piping plover chicks increase their vulnerability to vehicles. Chicks frequently move between the upper berm or foredune and feeding habitats in the wrack line and intertidal zone. These movements place chicks in the paths of vehicles driving along the berm or through the intertidal zone. Chicks stand in, walk, and run along tire ruts, and sometimes have difficulty crossing deep ruts or climbing out of them (Eddings et al. 1990, Strauss 1990, Howard et al. 1993). Chicks sometimes stand motionless or crouch as vehicles pass by, or do not move quickly enough to get out of the way (Tull 1984, Hoopes et al. 1992, Goldin 1993). Wire fencing placed around nests to deter predators (Rimmer and Deblinger 1990, Melvin et al. 1992) is ineffective in protecting chicks from vehicles because chicks typically leave the nest within a day after hatching and move extensively along the beach to feed (see Table 1).

Vehicles may also significantly degrade piping plover habitat or disrupt normal behavior patterns. They may harm or harass plovers by crushing wrack into the sand and making it unavailable as cover or a foraging substrate, by creating ruts that may trap or impede movements of chicks, and by preventing plovers from using habitat that is otherwise suitable (MacIvor 1990, Strauss 1990, Hoopes et al. 1992, Goldin 1993).

III. GUIDELINES FOR PROTECTING PIPING PLOVERS FROM RECREATIONAL DISTURBANCE

The Service recommends the following protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks.

MANAGEMENT OF NONMOTORIZED RECREATIONAL USES

On beaches where pedestrians, joggers, sun-bathers, picnickers, fishermen, boaters, horseback riders, or other recreational users are present in numbers that could harm or disturb incubating plovers, their eggs, or chicks, areas of at least 50 meter-radius around nests above the high tide line should be delineated with warning signs and symbolic fencing[(5)]. Only persons engaged in rare species monitoring, management, or research activities should enter posted areas. These areas should remain fenced as long as viable eggs or unfledged chicks are present. Fencing is intended to prevent accidental crushing of nests and repeated flushing of incubating adults, and to provide an area where chicks can rest and seek shelter when large numbers of people are on the beach.

Available data indicate that a 50 meter buffer distance around nests will be adequate to prevent harassment of the majority of incubating piping plovers. However, fencing around nests should be expanded in cases where the standard 50 meter-radius is inadequate to protect incubating adults or unfledged chicks from harm or disturbance. Data from various sites distributed across the plover's Atlantic Coast range indicates that larger buffers may be needed in some locations (see Table 2). This may include situations where plovers are especially intolerant of human presence, or where a 50 meter-radius area provides insufficient escape cover or alternative foraging opportunities for plover chicks.[(6)]

In cases where the nest is located less than 50 meters above the high tide line, fencing should be situated at the high tide line, and a qualified biologist should monitor responses of the birds to passersby, documenting his/her observations in clearly recorded field notes. Providing that birds are not exhibiting signs of disturbance, this smaller buffer may be maintained in such cases.

On portions of beaches that receive heavy human use, areas where territorial plovers are observed should be symbolically fenced to prevent disruption of territorial displays and courtship. Since nests can be difficult to locate, especially during egg-laying, this will also prevent accidental crushing of undetected nests. If nests are discovered outside fenced areas, fencing should be extended to create a sufficient buffer to prevent disturbance to incubating adults, eggs, or unfledged chicks.

Pets should be leashed and under control of their owners at all times from April 1 to August 31 on beaches where piping plovers are present or have traditionally nested. Pets should be prohibited on these beaches from April 1 through August 31 if, based on observations and experience, pet owners fail to keep pets leashed and under control.

Kite flying should be prohibited within 200 meters of nesting or territorial adult or unfledged juvenile piping plovers between April 1 and August 31.

Fireworks should be prohibited on beaches where plovers nest from April 1 until all chicks are fledged. (See the Service's February 4, 1997 *Guidelines for Managing Fireworks in the Vicinity of Piping Plovers and Seabeach Amaranth on the U.S. Atlantic Coast*.)

MOTOR VEHICLE MANAGEMENT

The Service recommends the following minimum protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks on beaches where vehicles are permitted. Since restrictions to protect unfledged chicks often impede vehicle access along a barrier spit, a number of management options affecting the timing and size of vehicle closures are presented here. Some of these options are contingent on implementation of intensive plover monitoring and management plans by qualified biologists. It is recommended that landowners seek concurrence with such monitoring plans from either the Service or the State wildlife agency.

Protection of Nests

All suitable piping plover nesting habitat should be identified by a qualified biologist and delineated with posts and warning signs or symbolic fencing on or before April 1 each year. All vehicular access into or through posted nesting habitat should be prohibited. However, prior to hatching, vehicles may pass by such areas along designated vehicle corridors established along the outside edge of plover nesting habitat. Vehicles may also park outside delineated nesting habitat, if beach width and configuration and tidal conditions allow. Vehicle corridors or parking areas should be moved, constricted, or temporarily closed if territorial, courting, or nesting plovers are disturbed by passing or parked vehicles, or if disturbance is anticipated because of unusual tides or expected increases in vehicle use during weekends, holidays, or special events.

If data from several years of plover monitoring suggests that significantly more habitat is available than the local plover population can occupy, some suitable habitat may be left unposted if the following conditions are met:

1. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:
    A. Estimates the number of pairs likely to nest on the site based on the past monitoring and regional population trends.

        AND

    B. Delineates the habitat that will be posted or fenced prior to April 1 to assure a high probability that territorial plovers will select protected areas in which to court and nest. Sites where nesting or courting plovers were observed during the last three seasons as well as other habitat deemed most likely to be pioneered by plovers should be included in the posted and/or fenced area.

        AND

    C. Provides for monitoring of piping plovers on the beach by a qualified biologist(s). Generally, the frequency of monitoring should be not less than twice per week prior to May 1 and not less than three times per week thereafter. Monitoring should occur daily whenever moderate to large numbers of vehicles are on the beach. Monitors should document locations of territorial or courting plovers, nest locations, and observations of any reactions of incubating birds to pedestrian or vehicular disturbance.

    AND

2. All unposted sites are posted immediately upon detection of territorial plovers.

Protection of Chicks

Sections of beaches where unfledged piping plover chicks are present should be temporarily closed to all vehicles not deemed essential. (See the provisions for essential vehicles below.) Areas where vehicles are prohibited should include all dune, beach, and intertidal habitat within the chicks' foraging range, to be determined by either of the following methods:

1. The vehicle free area should extend 1000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 2000 meter-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles.

   OR

2. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:
   A. Provides for monitoring of all broods during the chick-rearing phase of the breeding season and specifies the frequency of monitoring.

      AND

   B. Specifies the minimum size of vehicle-free areas to be established in the vicinity of unfledged broods based on the mobility of broods observed on the site in past years and on the frequency of monitoring. Unless substantial data from past years show that broods on a site stay very close to their nest locations, vehicle-free areas should extend at least 200 meters on each side of the nest site during the first week following hatching. The size and location of the protected area should be adjusted in response to the observed mobility of the brood, but in no case should it be reduced to less than 100 meters on each side of the brood. In some cases, highly mobile broods may require protected areas up to 1000 meters, even where they are intensively monitored. Protected areas should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. In a few cases, where several years of data documents that piping plovers on a particular site feed in only certain habitat types, the Service or the State wildlife management agency may provide written concurrence that vehicles pose no danger to plovers in other specified habitats on that site.

Timing of Vehicle Restrictions in Chick Habitat

Restrictions on use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.

When piping plover nests are found before the last egg is laid, restrictions on vehicles should begin on the 26th day after the last egg is laid. This assumes an average incubation period of 27 days, and provides a 1 day margin of error.

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on a date determined by one of the following scenarios:

1. With intensive monitoring: If the nest is monitored at least twice per day, at dawn and dusk (before 0600 hrs and after 1900 hrs) by a qualified biologist, vehicle use may continue until hatching begins. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers.

   OR

2. Without intensive monitoring: Restrictions should begin on May 15 (the earliest probable hatch date). If the nest is discovered after May 15, then restrictions should start immediately.

If hatching occurs earlier than expected, or chicks are discovered from an unreported nest, restrictions on vehicles should begin immediately.

If ruts are present that are deep enough to restrict movements of plover chicks, then restrictions on vehicles should begin at least 5 days prior to the anticipated hatching date of plover nests. If a plover nest is found with a complete clutch, precluding estimation of hatching date, and deep ruts have been created that could reasonably be expected to impede chick movements, then restrictions on vehicles should begin immediately.

Essential Vehicles

Because it is impossible to completely eliminate the possibility that a vehicle will accidently crush an unfledged plover chicks, use of vehicles in the vicinity of broods should be avoided whenever possible. However, the Service recognizes that life-threatening situations on the beach may require emergency vehicle response. Furthermore, some "essential vehicles" may be required to provide for safety of pedestrian recreationists, law enforcement, maintenance of public property, or access to private dwellings not otherwise accessible. On large beaches, maintaining the frequency of plover monitoring required to minimize the size and duration of vehicle closures may necessitate the use of vehicles by plover monitors.

Essential vehicles should only travel on sections of beaches where unfledged plover chicks are present if such travel is absolutely necessary and no other reasonable travel routes are available. All steps should be taken to minimize number of trips by essential vehicles through chick habitat areas. Homeowners should consider other means of access, eg. by foot, water, or shuttle services, during periods when chicks are present.

The following procedures should be followed to minimize the probability that chicks will be crushed by essential (non-emergency) vehicles:

1. Essential vehicles should travel through chick habitat areas only during daylight hours, and should be guided by a qualified monitor who has first determined the location of all unfledged plover chicks.
2. Speed of vehicles should not exceed five miles per hour.
3. Use of open 4-wheel motorized all-terrain vehicles (ATVs) or non-motorized all-terrain bicycles is recommended whenever possible for monitoring and law enforcement because of the improved visibility afforded operators.
4. A log should be maintained by the beach manager of the date, time, vehicle number and operator, and purpose of each trip through areas where unfledged chicks are present. Personnel monitoring plovers should maintain and regularly update a log of the numbers and locations of unfledged plover chicks on each beach. Drivers of essential vehicles should review the log each day to determine the most recent number and location of unfledged chicks.

Essential vehicles should avoid driving on the wrack line, and travel should be infrequent enough to avoid creating deep ruts that could impede chick movements. If essential vehicles are creating ruts that could impede chick movements, use of essential vehicles should be further reduced and, if necessary, restricted to emergency vehicles only.

SITE-SPECIFIC MANAGEMENT GUIDANCE

The guidelines provided in this document are based on an extensive review of the scientific literature and are intended to cover the vast majority of situations likely to be encountered on piping plover nesting sites along the U.S. Atlantic Coast. However, the Service recognizes that site-specific conditions may lead to anomalous situations in which departures from this guidance may be safely implemented. The Service recommends that landowners who believe such situations exist on their lands contact either the Service or the State wildlife agency and, if appropriate, arrange for an on-site review. Written documentation of agreements regarding departures from this guidance is recommended.

In some unusual circumstances, Service or State biologists may recognize situations where this guidance provides insufficient protection for piping plovers or their nests. In such a case, the Service or the State wildlife agency may provide written notice to the landowner describing additional measures recommended to prevent take of piping plovers on that site.

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1. Executive Order 11644, Use of Off-Road Vehicles on the Public Lands and Executive Order 11989, Off-Road Vehicles on Public Lands pertain to lands under custody of the Secretaries of Agriculture, Defense, and Interior (except for Indian lands) and certain lands under the custody of the Tennessee Valley Authority.

2. "Incubation" refers to adult birds sitting on eggs, to maintain them at a favorable temperature for embryo development.

3. "Precocial" birds are mobile and capable of foraging for themselves within several hours of hatching.

4. Wrack is organic material including seaweed, seashells, driftwood and other materials deposited on beaches by tidal action.

5. "Symbolic fencing" refers to one or two strands of light-weight string, tied between posts to delineate areas where pedestrians and vehicles should not enter.

6. For example, on the basis of data from an intensive three year study that showed that plovers on Assateague Island in Maryland flush from nests at greater distances than those elsewhere (Loegering 1992), the Assateague Island National Seashore established 200 meter buffers zones around most nest sites and primary foraging areas (Assateague Island National Seashore 1993). Following a precipitous drop in numbers of nesting plover pairs in Delaware in the late 1980's, that State adopted a Piping Plover Management Plan that provided 100 yard buffers around nests on State park lands and included intertidal areas (Delaware Department of Natural Resources and Environmental Control 1990).

Table 1. Summary of Chick Mobility Data

Source	Location	Data
Patterson 1988 (p.40)	Maryland and Virginia	18 of 38 broods moved to feeding areas more than 100 meters from their nests; 5 broods moved more than 600 meters (distance measured parallel to wrackline).
Cross 1989 (p.23)	Virginia	At three sites, observers relocated broods at mean distances from their nests of 153 m +/-97m (44 observations, 14 broods), 32 m +/-7 m (8 observations, 3 broods), and 492 m +/-281 m (12 observations, 4 broods).
Coutu et al. 1990 (p.12)	North Carolina	Observations of 11 broods averaged 212 m from their nests; 3 broods moved 400-725 m from nest sites.
Strauss 1990 (p.33)	Massachusetts	10 chicks moved more than 200 m during first 5 days post-hatch while 19 chicks moved less than 200 meters during same interval.
Loegering 1992 (p.72)	Maryland	Distances broods moved from nests during first 5 days post-hatch averaged 195 m in Bay habitat (n=10), 141 m in Interior habitat (n=36), and 131 m in Ocean habitat (n=41). By 21 days, average movement in each habitat had, respectively, increased to 850 m (n=1), 464 m (n=10), and 187 m (n=69). One brood moved more than 1000 m from its nest.
Melvin et al. 1994	Massachusetts and New York	In 14 incidents in which 18 chicks were killed by vehicles, chicks were run over $\leq$ 10 m to $\leq$ 900 m from their nests. In 7 of these instances, mortality occurred $\geq$ 200 m from the nest.

Table 2. Summary of Data on Distances at which Piping Plovers React to Disturbance

Source	Location	Data
Flushing of Incubating Birds by Pedestrians		

Flemming et al. 1988 (p.326)	Nova Scotia	Adults usually flushed from the nests at distances <40 m; however, great variation existed and reaction distances as great as 210 m were observed.
Cross 1990 (p.47)	Virginia	Mean flushing distances in each of two years were 47 m (n=181, range = 5 m to 300 m) and 25 m (n=214, range = 2 m to 100 m).
Loegering 1992 (p.61)	Maryland	Flushing distances averaged 78 m (n=43); range was 20 m to 174 m. Recommended use of 225 m disturbance buffers on his site.
Cross and Terwilliger 1993	Virginia	Mean flushing distance for all years on all sites (Virginia plover sites, 1986-91) was 63 m (n=201, SD=31, range = 7 m to 200 m). Differences among years were not significant, but differences among sites were.
Hoopes 1993 (p.72)	Massachusetts	Mean flushing distance for incubating plovers was 24 m (n=31).
Disturbance to Non-incubating Birds		
Hoopes 1993 (p.89)	Massachusetts	Mean response distance (all ages, all behaviors) was 23 m for pedestrian disturbances (range = 10 m to 60 m), 40 m for vehicles (range = 30 m to 70 m), 46 m for dogs/pets (range = 20 m to 100 m), and 85 m for kites (range = 60 m to 120 m).
Goldin 1993b (p.74)	New York	Average flushing distance for adult and juvenile plovers was 18.7 m for pedestrian disturbances (n=585), 19.5 m for joggers (n=183), and 20.4 m for vehicles (n=111). Pedestrians caused chicks to flush at an average distance of 20.7 m (n=175), joggers at 32.3 m (n=37), and vehicles at 19.3 m (n=7). Tolerance of individual birds varied; one chick moved 260 m in direct response to 20 disturbances in 1 hour.

Tracks

Name: Symbolic Fence 2002

Distance: 934 feet

Area: 1.419 acres

0.002 sq. miles

Log Points: 7

Name: Sym Fence 2004

Distance: 785 feet

Area: 39900 feet

0.916 acres

Log Points: 6

Name: SYM FENCE 2001

Distance: 687 feet

Log Points: 7

Markers

Name: Plover Nest 2004

Short Name: PlvrNs

Coordinates: 19 351685 E, 4743393 N

Name: HORSE BARN

Short Name: HORSE BARN

Coordinates: 19 351514 E, 4743513 N

Name: Plover Nest 2001

Short Name: PlvrNs

Coordinates: 19 351627 E, 4743548 N

Name: Plover Nest 2002

Short Name: PlvrNs

Coordinates: 19 350859 E, 4742680 N

dcr and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach State Res.

1. **Activity:** Beach Patrols

2. **Brief Description of the Activity:** Law enforcement Patrols

3. **Type of Vehicle:**
   - __ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - __ front end loader
   - __ rescue vehicle
   - __ beach cleaner
   - ✓ 4 wheel ATV
   - __ 3 wheel ATV
   - __ tractor
   - __ private vehicle
   - __ other - what?

4. **Type of Use:**
   - ✓ emergency/rescue
   - __ environmental police
   - ✓ municipal police
   - __ garbage collection
   - __ beach cleaning
   - __ storm cleanup/repair
   - __ spring setup(boardwalks, etc.)
   - __ end-of-season removal(boardwalks, etc.)
   - __ winter snowfence setup
   - __ winter snowfence removal
   - __ beach grass planting
   - __ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what?

5. **Where on Beach is Vehicle Driven:**
   - ✓ along water's edge
   - ✓ at wrack line(high tide line)
   - ✓ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - __ in or through dunes

6. **Season of activity(or from what date to what date):** Memorial Day weekend thru Labor Day

7. **Frequency of use(how often), time(s) of day:** daily 10am - 2pm

8. **Can this activity be done in a different way, or without a vehicle?** NO

   If so, how?

dcr and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach State Res.

1. **Activity:** Beach Cleaning / Debris removal

2. **Brief Description of the Activity:** pulls beach cleaner, Fast Falls Lifeguard stands, removes large debris off beach

3. **Type of Vehicle:**
   - __ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - ✓ front end loader
   - __ rescue vehicle
   - __ beach cleaner
   - __ 4 wheel ATV
   - __ 3 wheel ATV
   - ✓ tractor
   - __ private vehicle
   - __ other - what? _____

4. **Type of Use:**
   - ✓ emergency/rescue
   - __ environmental police
   - __ municipal police
   - __ garbage collection
   - ✓ beach cleaning
   - ✓ storm cleanup/repair
   - ✓ spring setup(boardwalks, etc.)
   - ✓ end-of-season removal(boardwalks, etc.)
   - __ winter snowfence setup
   - __ winter snowfence removal
   - __ beach grass planting
   - __ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what? _____

5. **Where on Beach is Vehicle Driven:**
   - __ along water's edge
   - ✓ at wrack line(high tide line)
   - __ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - __ in or through dunes

6. **Season of activity(or from what date to what date):** April - October

7. **Frequency of use(how often), time(s) of day:** Daily 6am - 2pm

8. **Can this activity be done in a different way, or without a vehicle?**

   If so, how? ND

dcr and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach State Res.

1. **Activity:** Beach Cleaning

2. **Brief Description of the Activity:** Used to clean debris washed up on the beach.

3. **Type of Vehicle:**
   - __ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - __ front end loader
   - __ rescue vehicle
   - ✓ beach cleaner
   - __ 4 wheel ATV
   - __ 3 wheel ATV
   - __ tractor
   - __ private vehicle
   - __ other - what?

4. **Type of Use:**
   - __ emergency/rescue
   - __ environmental police
   - __ municipal police
   - __ garbage collection
   - ✓ beach cleaning
   - __ storm cleanup/repair
   - __ spring setup(boardwalks, etc.)
   - __ end-of-season removal(boardwalks, etc.)
   - __ winter snowfence setup
   - __ winter snowfence removal
   - __ beach grass planting
   - __ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what?

5. **Where on Beach is Vehicle Driven:**
   - __ along water's edge
   - ✓ at wrack line(high tide line)
   - __ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - __ in or through dunes

6. **Season of activity(or from what date to what date):** May - Sept
   May 1st thru Labor Day

7. **Frequency of use(how often), time(s) of day:** Daily 6am - 2pm

8. **Can this activity be done in a different way, or without a vehicle?** __

   If so, how? ND

and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach Reservation

1. **Activity:** Lifeguarding Function

2. **Brief Description of the Activity:** Used to patrol beach front and assist with rescues. and all other lifeguard activities

3. **Type of Vehicle:**
   - __ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - __ front end loader
   - __ rescue vehicle
   - __ beach cleaner
   - __ 4 wheel ATV
   - __ 3 wheel ATV
   - __ tractor
   - __ private vehicle
   - ✓ other - what? 4x4 gator

4. **Type of Use:**
   - ✓ emergency/rescue
   - ✓ environmental police
   - __ municipal police
   - __ garbage collection
   - __ beach cleaning
   - __ storm cleanup/repair
   - __ spring setup(boardwalks, etc.)
   - __ end-of-season removal(boardwalks, etc.)
   - __ winter snowfence setup
   - __ winter snowfence removal
   - __ beach grass planting
   - ✓ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what?

5. **Where on Beach is Vehicle Driven:**
   - ✓ along water's edge
   - ✓ at wrack line(high tide line)
   - ✓ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - ✓ in or through dunes

6. **Season of activity(or from what date to what date):** From opening day to closing date. May to Sept

7. **Frequency of use(how often), time(s) of day:** Used 7 days a week from 9AM - 5pm

8. **Can this activity be done in a different way, or without a vehicle?** __

   If so, how? NO

and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach Reservation

1. **Activity:** Lifeguarding Function

2. **Brief Description of the Activity:** Used to patrol beach front and assist with rescues. and all other lifeguard activities

3. **Type of Vehicle:**
   - __ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - __ front end loader
   - __ rescue vehicle
   - __ beach cleaner
   - (3) ✓ 4 wheel ATV
   - __ 3 wheel ATV
   - __ tractor
   - __ private vehicle
   - __ other - what?

4. **Type of Use:**
   - ✓ emergency/rescue
   - ✓ environmental police
   - __ municipal police
   - __ garbage collection
   - __ beach cleaning
   - __ storm cleanup/repair
   - __ spring setup(boardwalks, etc.)
   - __ end-of-season removal(boardwalks, etc.)
   - __ winter snowfence setup
   - __ winter snowfence removal
   - __ beach grass planting
   - ✓ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what?

5. **Where on Beach is Vehicle Driven:**
   - ✓ along water's edge
   - ✓ at wrack line(high tide line)
   - ✓ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - ✓ in or through dunes

6. **Season of activity(or from what date to what date):** From opening day to closing date. May to Sept

7. **Frequency of use(how often), time(s) of day:** Used 7 days a week from 9AM - 5pm

8. **Can this activity be done in a different way, or without a vehicle?** __

   If so, how? NO

dcr and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach Reservation

1. **Activity:** Lifeguarding Function

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3. **Type of Vehicle:**
   - ✓ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - __ front end loader
   - ✓ rescue vehicle
   - __ beach cleaner
   - __ 4 wheel ATV
   - __ 3 wheel ATV
   - __ tractor
   - __ private vehicle
   - __ other - what? _____

4. **Type of Use:**
   - ✓ emergency/rescue
   - __ environmental police
   - __ municipal police
   - __ garbage collection
   - __ beach cleaning
   - __ storm cleanup/repair
   - __ spring setup(boardwalks, etc.)
   - __ end-of-season removal(boardwalks, etc.)
   - __ winter snowfence setup
   - __ winter snowfence removal
   - __ beach grass planting
   - __ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what? _____

5. **Where on Beach is Vehicle Driven:**
   - ✓ along water's edge
   - ✓ at wrack line(high tide line)
   - ✓ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - __ in or through dunes

6. **Season of activity(or from what date to what date):** From opening day to closing date. May to Sept

7. **Frequency of use(how often), time(s) of day:** Used 7 days a week from 9Am - 5pm

8. **Can this activity be done in a different way, or without a vehicle?** _____

   If so, how? NO

dcr and Official Vehicle Use on the Beach

Please fill out a separate form for each management activity at your park that involves the use of a vehicle on the beach. Do not combine different activities on the same form. For items 3, 4, and 5, check off all that apply.

Park/Reservation: Salisbury Beach State Res.

1. **Activity:** Beach Cleaning

2. **Brief Description of the Activity:** Debris is dumped into back of dump truck for removal/snow fence installation boardwalk installation + removal etc.

3. **Type of Vehicle:**
   - __ 1/2 ton pick up
   - __ trash packer truck
   - __ 3/4 ton stake truck
   - __ front end loader
   - __ rescue vehicle
   - __ beach cleaner
   - __ 4 wheel ATV
   - __ 3 wheel ATV
   - __ tractor
   - __ private vehicle
   - __ other - what?

   (2) ~~1 ton~~ Dump trucks

4. **Type of Use:**
   - __ emergency/rescue
   - __ environmental police
   - __ municipal police
   - ✓ garbage collection
   - ✓ beach cleaning
   - ✓ storm cleanup/repair
   - ✓ spring setup(boardwalks, etc.)
   - ✓ end-of-season removal(boardwalks, etc.)
   - ✓ winter snowfence setup
   - ✓ winter snowfence removal
   - ✓ beach grass planting
   - __ rare species monitoring
   - __ rare species protection
   - __ handicapped access
   - __ other - what?

5. **Where on Beach is Vehicle Driven:**
   - ✓ along water's edge
   - __ at wrack line(high tide line)
   - __ in wet sand area
   - ✓ above high tide
   - ✓ along edge of dune
   - __ in or through dunes

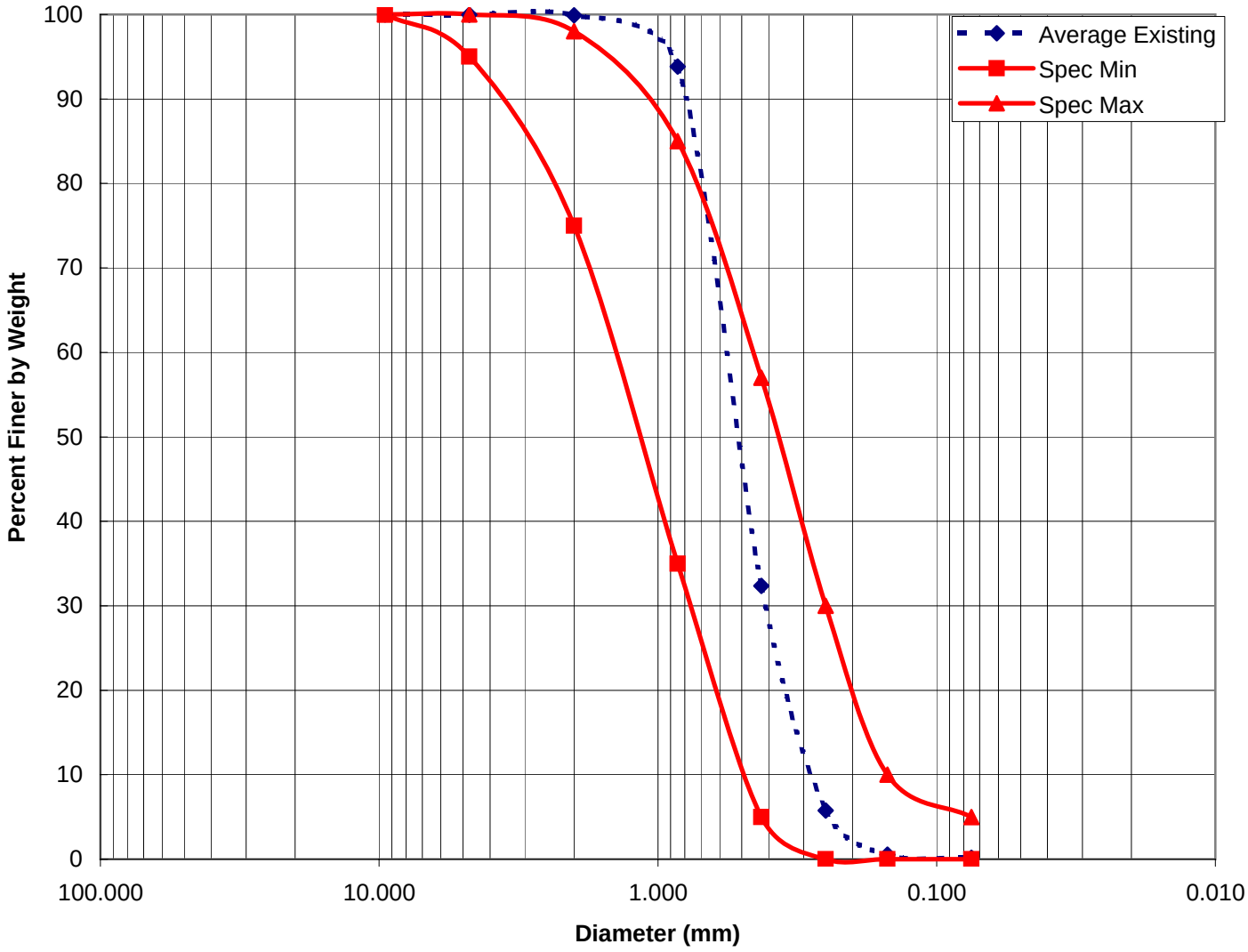
6. **Season of activity(or from what date to what date):** Year Round

7. **Frequency of use(how often), time(s) of day:** 3-4 times/week out the off season. Daily during the peak season 730-400pm

8. **Can this activity be done in a different way, or without a vehicle?** ____

   If so, how? ND

Salisbury Beach Sand
Gradation Specification
for Off-Site Sourcing of Material



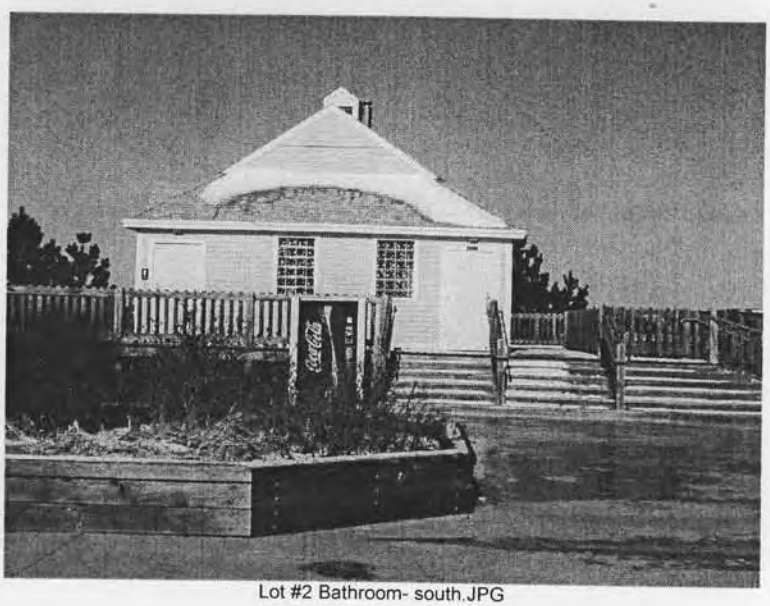
Lot #1 Bathroom- North.JPG

Lot #1 Bathroom- West.JPG

Lot #2 Bathroom- 45 angle.JPG

Lot #2 Bathroom- East.JPG

Lot #2 Bathroom- North.JPG



Lot #2 Bathroom- south.JPG

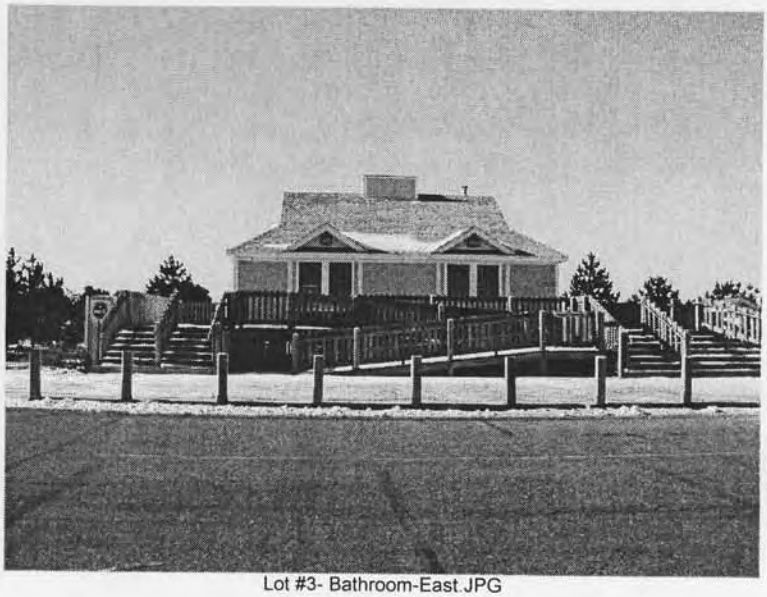
Lot #2- Bathroom- West.JPG

Lot #3 Bathroom- 45 angle.JPG

Lot #3 Bathroom- South.JPG

Lot #3- Bathroom- North.JPG

Lot #3- Bathroom- west.JPG



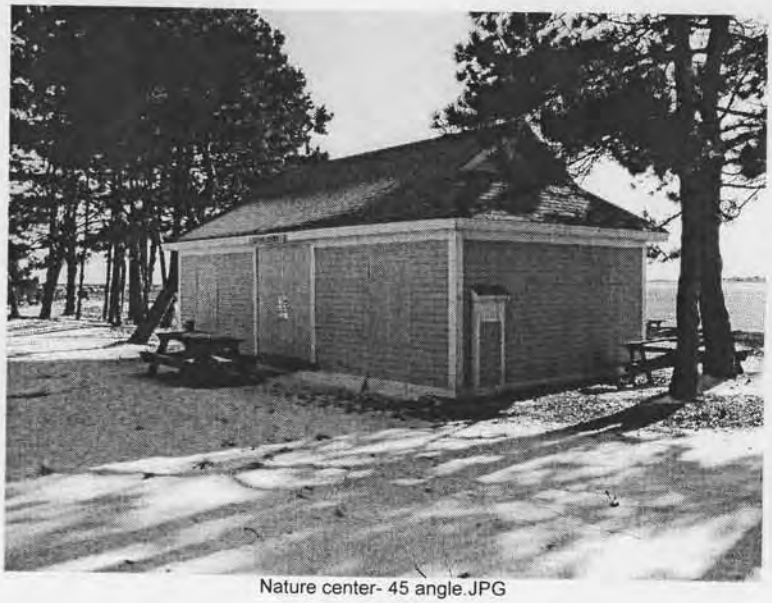
Lot #3- Bathroom-East.JPG

HQ- West.JPG

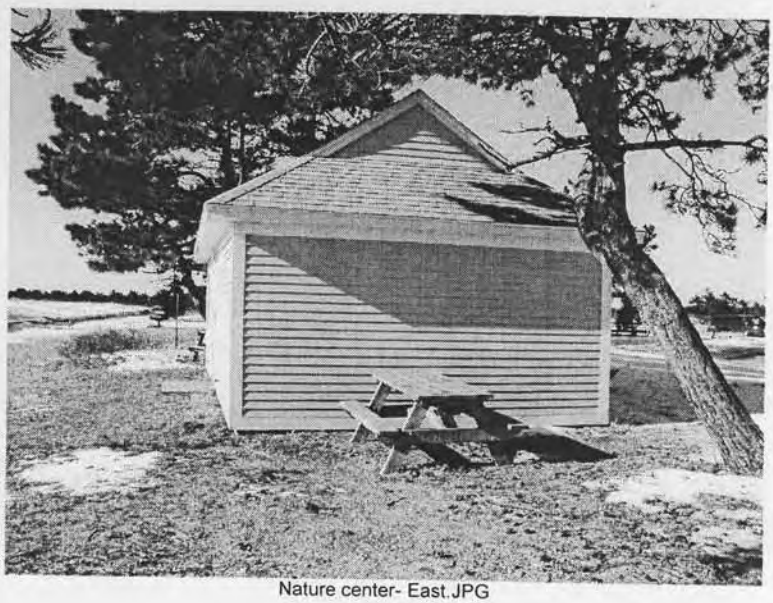
Lot #1 Bathoom- South.JPG

Lot #1 Bathroom- 45 angle.JPG

Lot #1 Bathroom- East.JPG

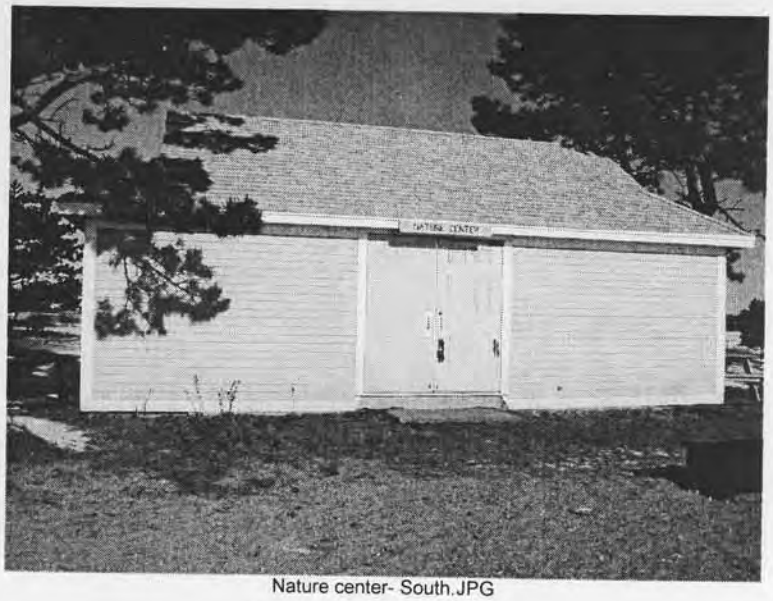


Nature center- 45 angle.JPG

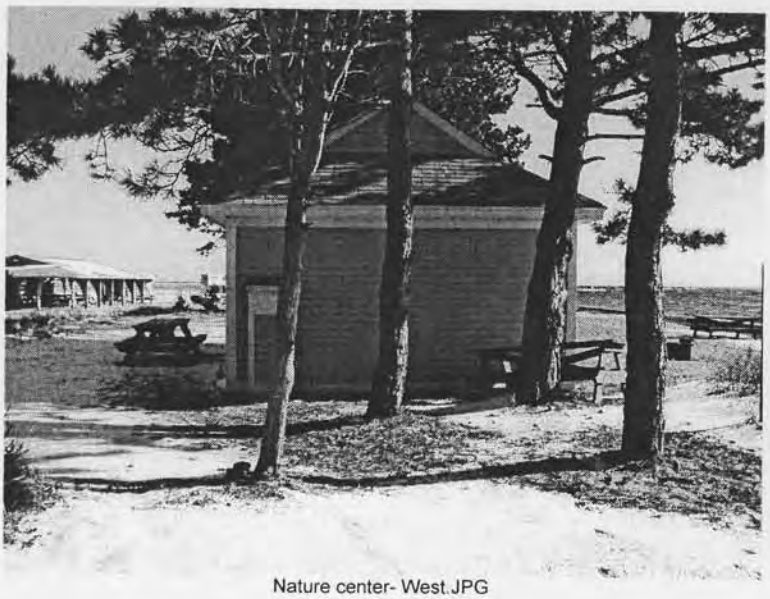


Nature center- East.JPG

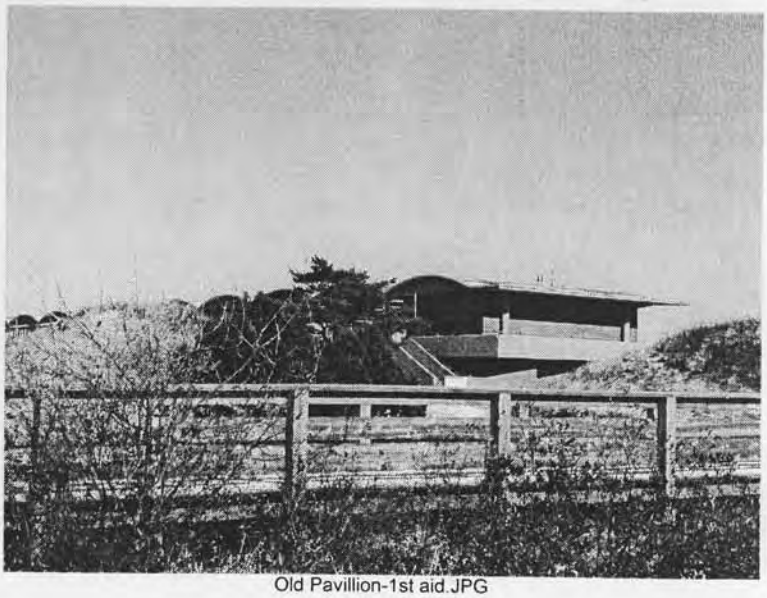
Nature center- North.JPG



Nature center- South.JPG

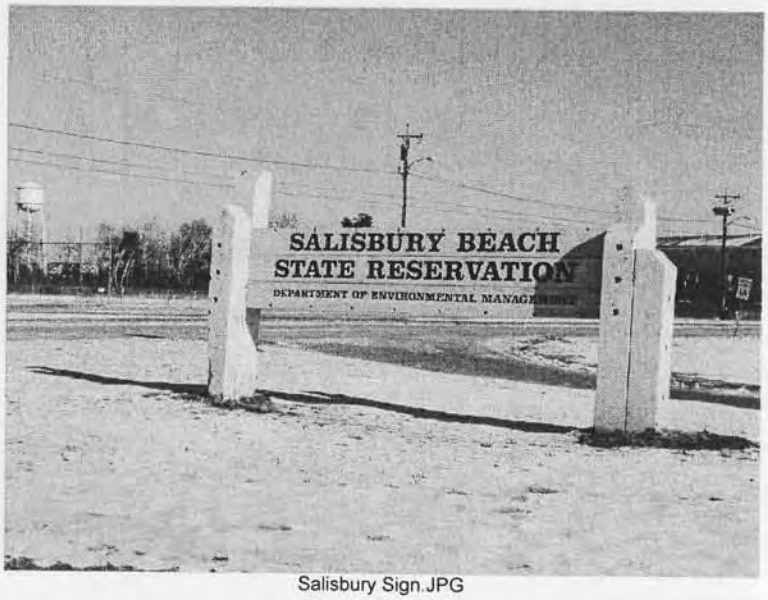


Nature center- West.JPG



Old Pavillion-1st aid.JPG

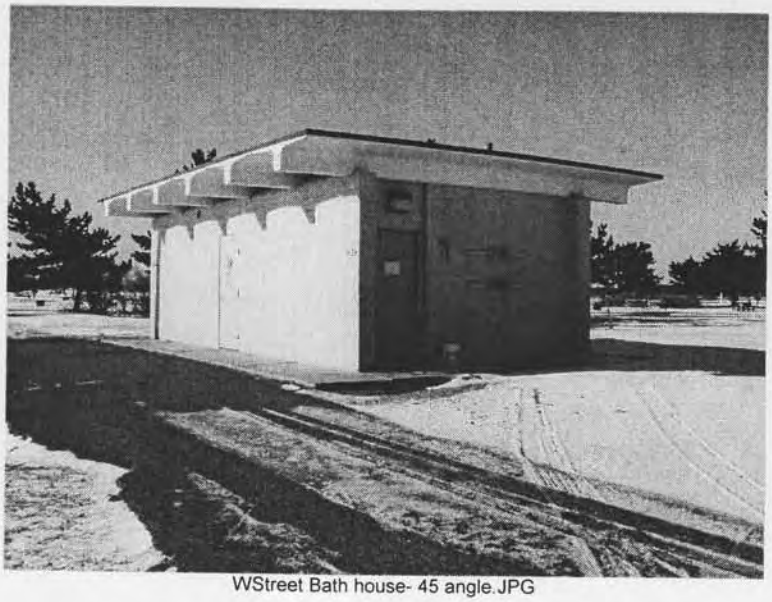
Old Pavillion-west.JPG



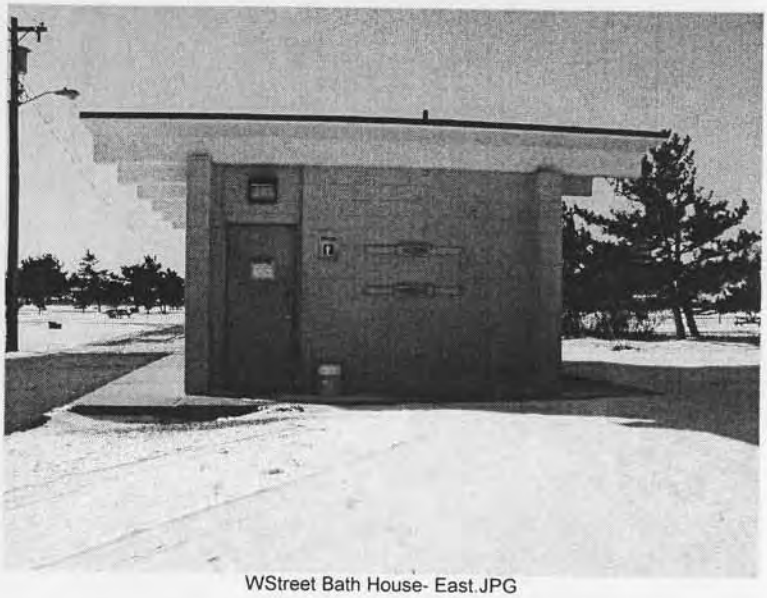
Salisbury Sign.JPG

Stables- 45 angle.JPG

Stables- West.JPG

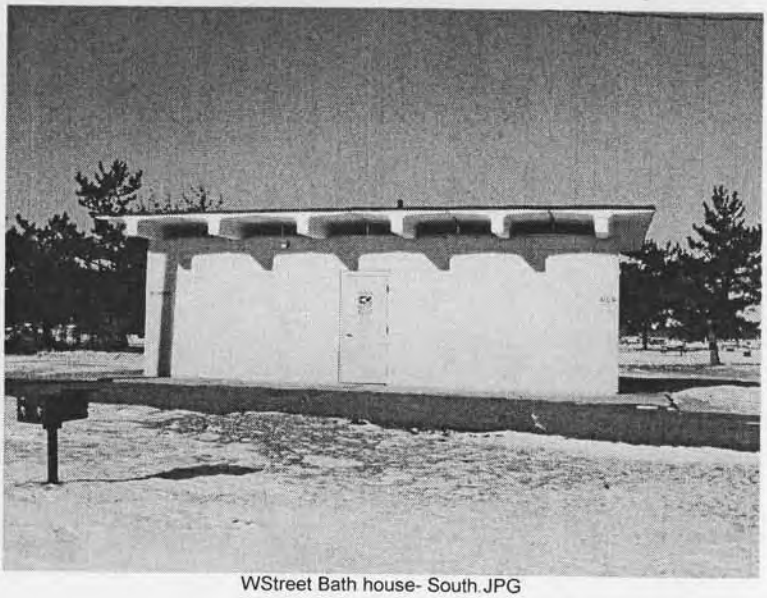


WStreet Bath house- 45 angle.JPG

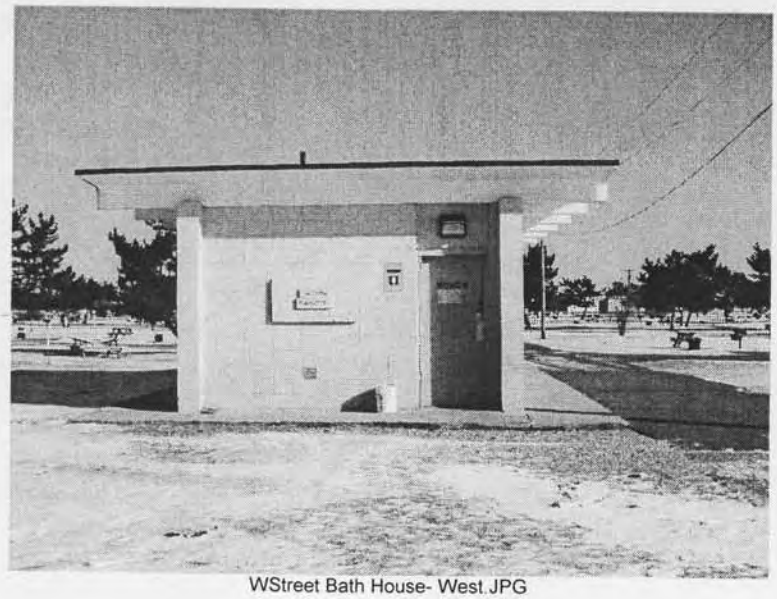


WStreet Bath House- East.JPG

WStreet Bath House- North.JPG



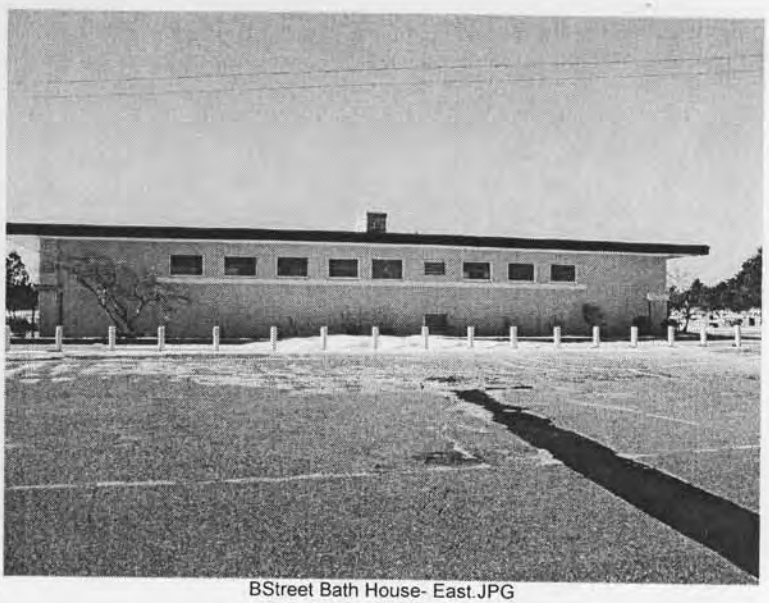
WStreet Bath house- South.JPG



WStreet Bath House- West.JPG

Salisbury Beach.

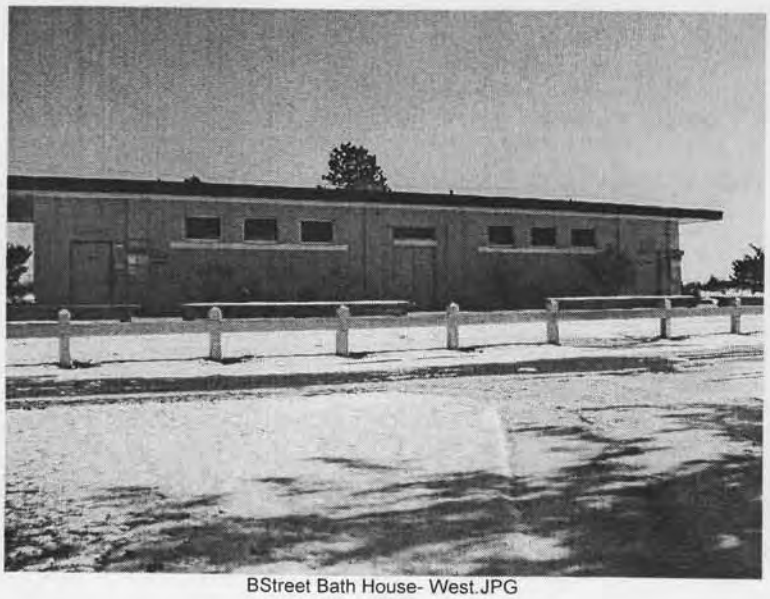
Bstreet Bath House- 45 angle.JPG



BStreet Bath House- East.JPG

BStreet Bath House- North.JPG

BStreet Bath House- South.JPG



BStreet Bath House- West.JPG

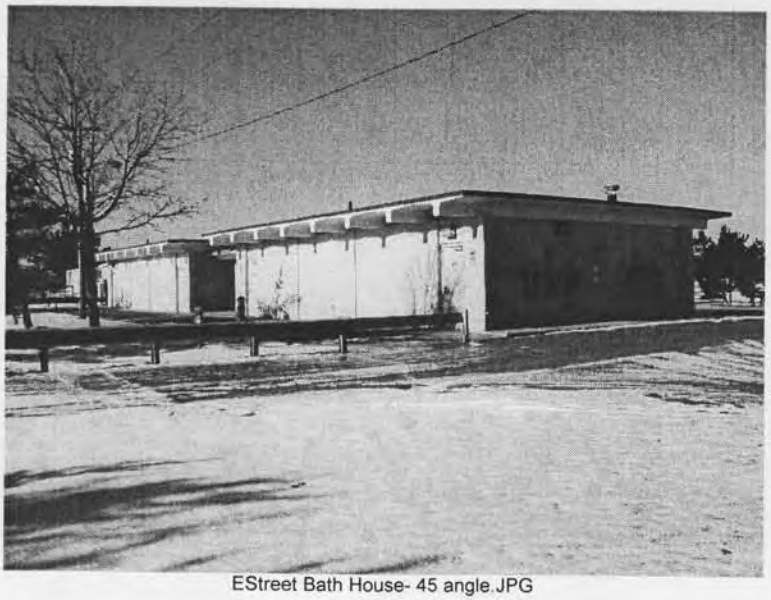
Contact Station- 45 Angle.JPG

Contact Station- North.JPG

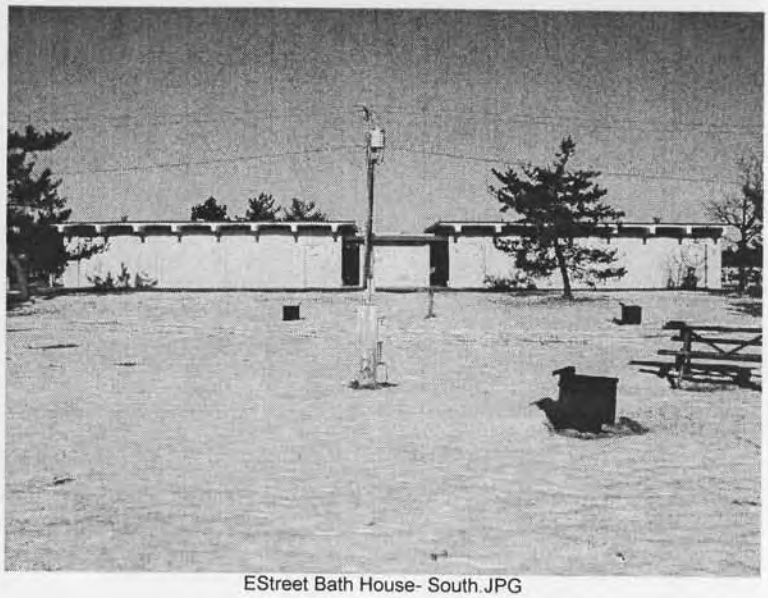
Contact station- South.JPG

Contact Station-West.JPG

Contact- East.JPG



EStreet Bath House- 45 angle.JPG



EStreet Bath House- South.JPG

EStreet- Bath House- East.JPG

EStreet- Bath House- North.JPG

EStreet- Bath House- West.JPG

Group Pavillion- 45 angle.JPG

HQ- 45 angle.JPG

HQ- East.JPG

HQ- North.JPG

HQ- South.JPG